AMERICAN JOURNAL OF PUBLIC HEALTH
and
THE NATION'S HEALTH

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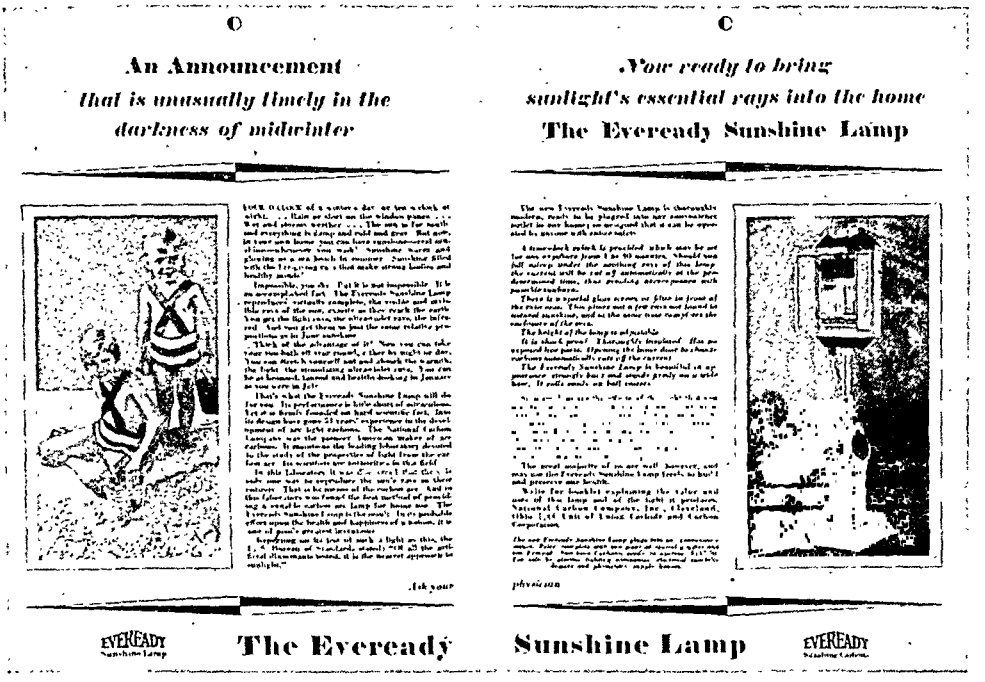
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Now you can prescribe LIGHT for home application

THE Eveready Sunshine Lamp and Eveready Sunshine Carbons, two products of the National Carbon Company, Inc., have been designed to bring into the home for use at any time and any season all the essential rays of natural summer sunshine. Ultra-violet, visible and infra-red rays are reproduced in substantially the same proportions as are found in natural sunshine. This lamp gives physicians an opportunity to prescribe controlled sunlight which can be safely used at home in prevention and cure of rickets and other cases where sunlight is indicated.

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Regarding this conservative, ethical policy the Council on Physical Therapy of the American Medical Association had the following to say: "Your letter of July 2, 1928, outlining the proposed policy of National Carbon Company, Inc., was submitted to the Council for consideration. The policy therein outlined is acceptable to the Council."

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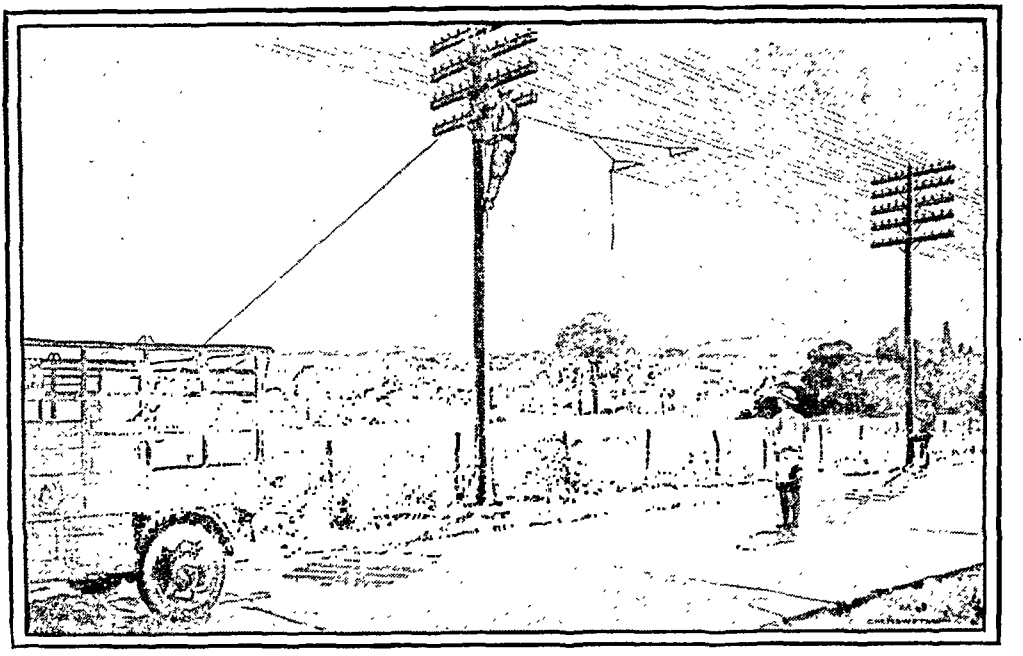
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The U. S. A. is only a few minutes wide

An Advertisement of the
American Telephone and Telegraph Company

IN THE gold rush year of '49 a stagecoach succeeded in crossing the continent in about three months. Two decades later, for the first time, an unbroken stretch of railroad lay from New York Harbor to San Francisco Bay, and America was seven days wide. Today, by telephone, *that entire width is only* a matter of minutes. And these few minutes represent a round trip, taken in the ease of office or home.

The Bell System is ever busy reducing the width of America and the distance between cities. For example, during 1929 it will add to its lines nearly 2,000,000 of the new permalloy loading coils for correcting and maintaining the speeding voice currents.

Seven thousand miles of new intercity cable, $40,000,000 worth, will be added to the System to protect against storms and other slowing up influences.

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Since New Year's Day, 1927, the average time for completing all out of town calls has been cut 35 per cent and at the same time the per cent of error has been further materially reduced.

There is no standing still in the Bell System. Better and better telephone service at the lowest cost is the goal. Present improvements constantly going into effect are but the foundation for the future's greater service.

"THE TELEPHONE BOOKS ARE THE DIRECTORY OF THE NATION"

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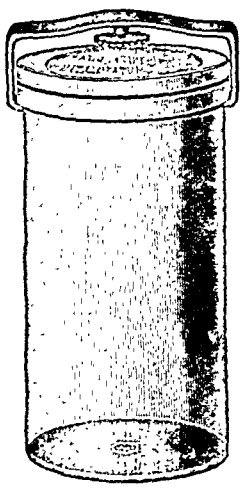
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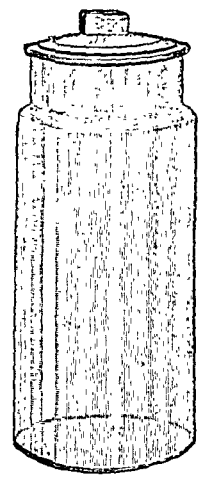
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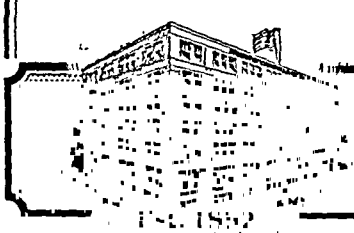
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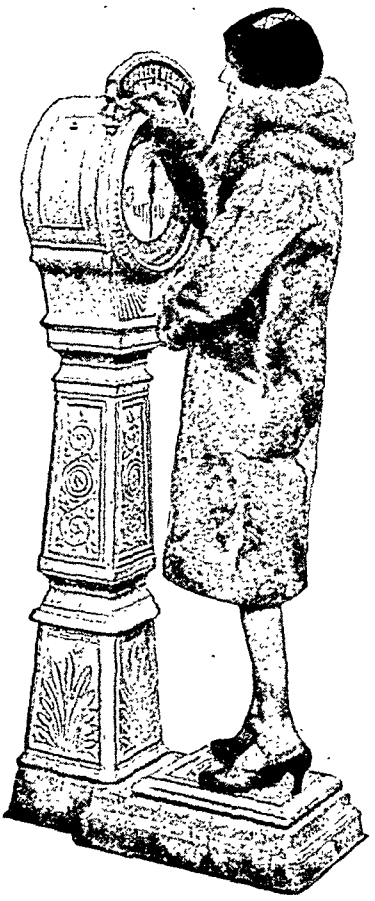
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LABORATORY SUPPLIES

STALKING THE FOOD FADDIST

It is time for common sense, aided by sane medical and scientific opinion, to put an end to dangerous dieting fads.



EMINENT doctors of medicine are making it hard for the food faddist to maintain his hold on the credulity of the American public. Dr. Morris Fishbein, in "Your Weight and How to Control It," says: "Of all the fads which have afflicted mankind, none seem more difficult to explain than the desire of American women for the barber-pole figure." Other authorities, in the same volume, warn of the permanent injury likely to result from starvation diets.

Dr. Solomon Strouse, Associate Professor of Medicine at Rush Medical College, in his address at the New York Academy of Medicine, as quoted by the *Evening World*, said: "I am beginning seriously to wonder whether scientific efforts at diet control based on animal experiment are not overshooting the mark; whether we are not interpreting the life of a caged white rat rather too seriously for the comfort of a free white man." He went on to say that "food and food habits in general play no important role in the attainment of longevity.... Despite much that I read of the evils of the modern way of eating and living, I find in actual practice comparatively few examples of excessive food indulgence to the point of harm. ... It is possible to conceive of undernutrition causing more trouble than overeating."

The trend of modern dieting thought is that human beings should not only eat a variety of healthful foods, but enjoy them. Yet few people will force themselves very long to eat foods that they do not like. As a food scientist says, "It is sugar which makes it possible for us to eat and enjoy the roughage foods, the vitamine foods, and foods rich in mineral salts." Fruit flavors are developed by sugar. Sugar facilitates the ingestion of fruits, cereals and vegetables.

An eminent biological chemist refers to sugar as "Nature's incomparable flavoring agent." "Sugar," he says, "is the thing which makes the deadly dullness of our overly refined foods palatable. Another thing, it is wholesome."

There is no substitute for sugar. Appetizing cookery revolves around sugar. The Sugar Institute, 129 Front Street, New York.

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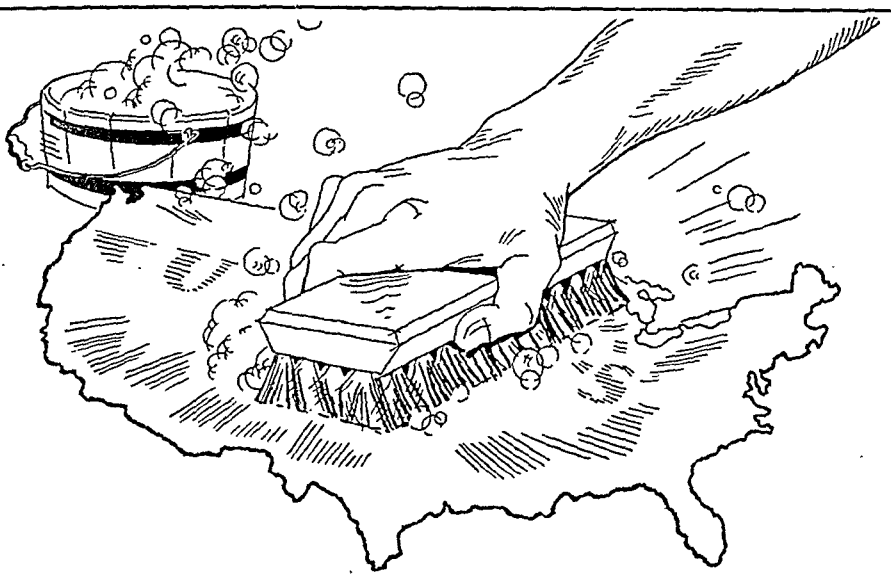
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Progress!

"Established to promote public welfare by teaching the value of cleanliness"—such is the purpose of Cleanliness Institute.

What has been accomplished? Here in brief is the record for 1928, the first full year of the Institute's existence.

Cleanliness messages reached audiences in the tens of millions through the printed page, the microphone, and the cooperation of thousands of officials and organizations. *The aggregate circulation—or the number of times that cleanliness educational messages were repeated—reached the impressive total of 671,000,000.* This number, tremendous as it is, will probably be exceeded in 1929.

Outstanding among the activities of the Institute has been the publication of three graded supplementary school readers of unusual charm and value, written by authorities, well illustrated, pedagogically sound, aimed at inculcating habits as well as knowledge. These cleanliness stories and texts have been instantly popular with school administrators and teachers. School leaders have asked for hundreds of thousands of copies.

The cooperation of the Institute is yours for the asking. Gratifying progress has already been made. Even greater usefulness can result as interest increases among leaders of public thought and organization.

Are you in touch with the Institute? If not why not write today?

CLEANLINESS INSTITUTE

Established to promote public welfare by teaching the value of cleanliness

45 EAST 17th ST., NEW YORK

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Beverages and their relation to health

IN a recent health survey, 83 mothers per 100 replied "yes" to the question, "have you found it necessary to warn your children about dangerous beverages, such as those containing artificial flavoring and coloring or drugs or other harmful ingredients?"

Furthermore, they stated that they had urged the children to change to Hires. There is a widespread awakening among parents as to their responsibility in directing the child as to *safe* beverages.

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Hires is as appetizing as it is pure—a welcome beverage in millions of homes. Its ever-increasing popularity is undoubtedly due to its acceptance as a *protective* beverage.

FREE: A sample of Hires Extract for making Root Beer at home will be sent to any doctor or health officer upon request.

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NUTRITION experts agree almost without exception on the necessity of a balanced diet. Any attempt to educate the layman on this subject must undertake a revision of many old-fashioned ideas.

One of these ideas is the notion that the eating of candy is a mere indulgence. For from the standpoint of nutrition, candy is a food. The problem of the nutrition expert is to get people to eat it sensibly, as part of a balanced diet.

We, the National Confectioners' Association, are conducting an educational campaign, urging the public to take a rational attitude toward candy, to consider it in proper relation to other foods. We invite suggestions for the improvement of the campaign from those professionally interested in public health.

A large number of technical men have written us. We would like to hear from a great many more. The writers do us a great service, and we believe do a service to the public.

Educational Department
NATIONAL CONFECTIONERS' ASSOCIATION
180 West Washington Street, Chicago

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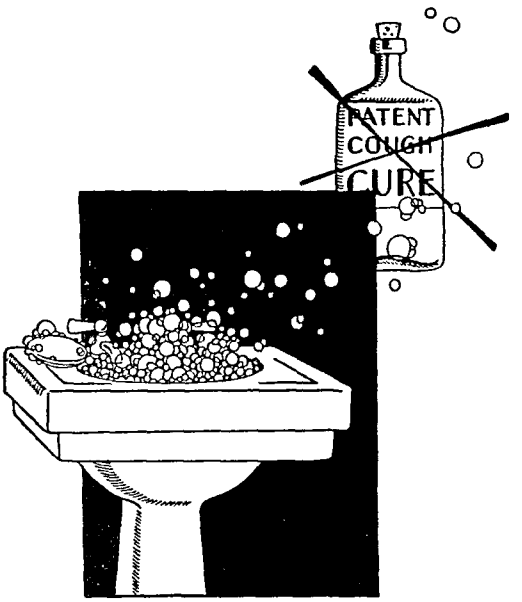
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Prevention *instead of* Prescription

Help keep from catching colds by washing your hands often, particularly before meals. This simple precaution is worth practicing at all times but especially now.

Excerpt from U.S.P.H.S. Influenza Commission report . . .

ing or spitting.
2. Special emphasis upon the need of washing the hands frequently, more especially before eating; unclean articles and fingers should be kept out of the mouth and nose. This advice is particularly applicable to all persons in attendance upon the sick.
3. Avoidance of exposure

Dirty hands are more likely than clean hands to transmit germs to the mouth, whether of colds or any other communicable disease. Clean hands, clean dishes, clean handkerchiefs, and clean clothes mean less colds, influenza and pneumonia.

If you have any responsibility in bettering health conditions, Cleanliness Institute has available helpful literature and pictures.

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Established to promote public welfare by teaching the value of cleanliness

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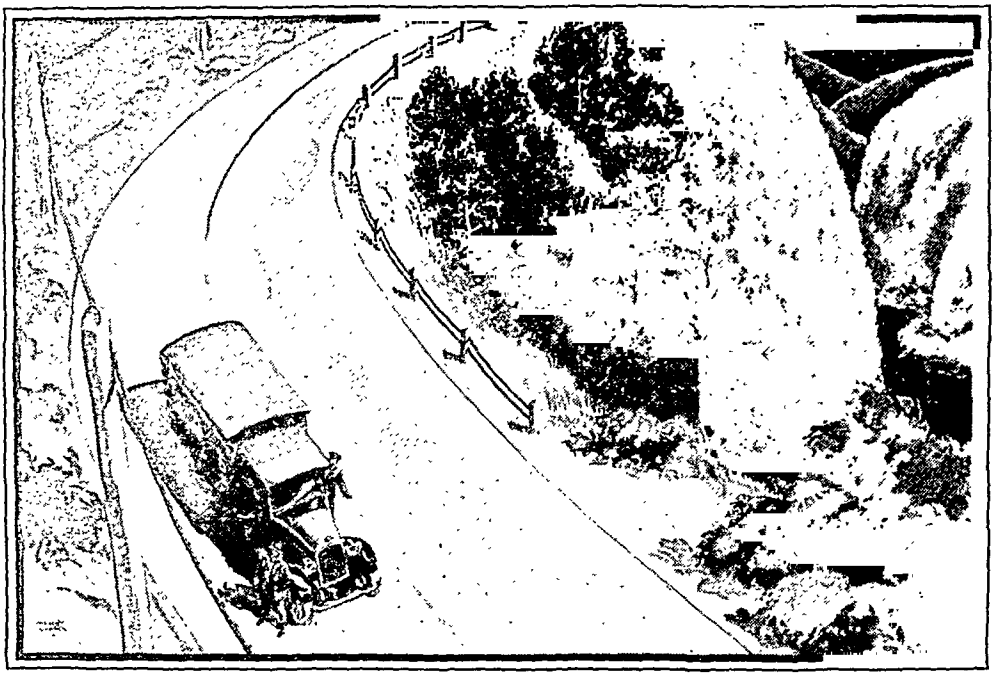
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DURING the afternoon of March 17, 1928, an alarm bell rang in a telephone test station in the heart of the Alleghany mountains. This meant that a puncture had been made in the air-tight sheath of a busy inter-city cable. The men on duty knew that the injury was somewhere within 50 miles.

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There is no standing still in the Bell System. Constant progress in accuracy and better service at the lowest cost is its goal.

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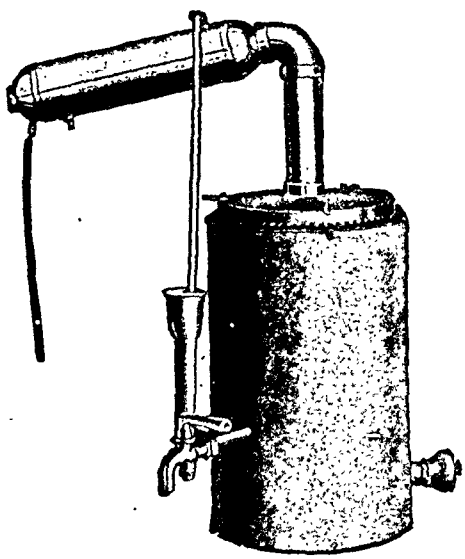
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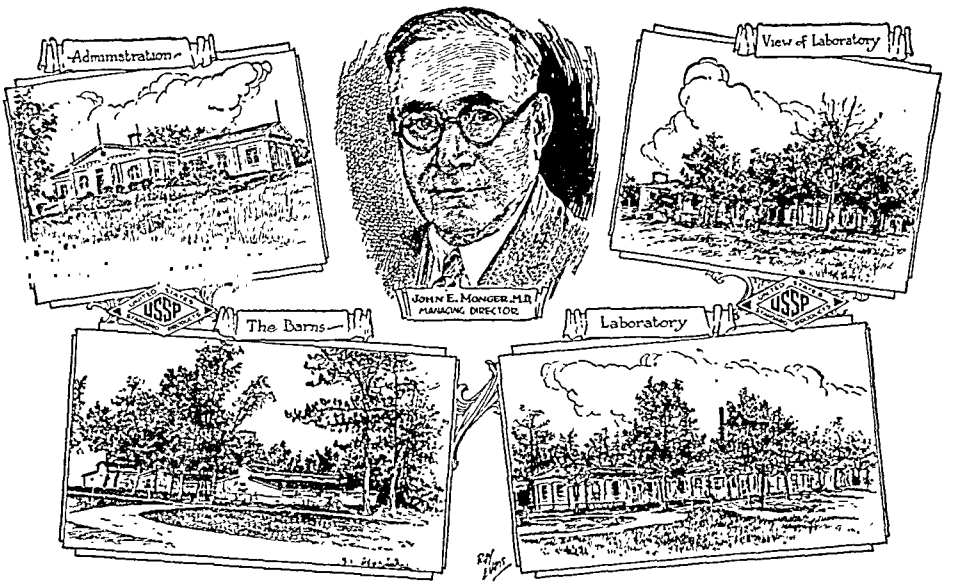
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The "Left-behinds"

A SHORT time ago a business man, happily married and the father of two children, showed signs of failing health. A searching examination revealed tuberculosis. He was ordered to give up his business immediately and go to a sanatorium for proper treatment and care.

An uncle of the young man was greatly shocked when he heard the report. He asked for the evidence. They handed him x-ray photographs which showed that his nephew's lungs were seriously affected. The uncle asked permission to show the photographs to his own doctor.

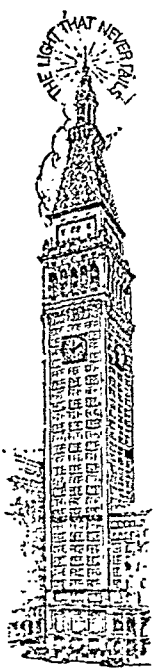
When that doctor saw the photographs he said, "The right thing was done. Your nephew will probably get well. Now, what have you done for the man's family, especially the children? Have they been examined? You have no time to lose. While tuberculosis may not have made any serious inroads on their health as yet, it is hardly conceivable that his wife and children are entirely free from infection."

Every child who at any age has had prolonged exposure to tuberculosis should have an immediate, thorough physical examination, especially including the tuberculin tests and x-ray photographs, to determine whether or not active or latent disease is present. While tuberculosis usually attacks the lungs, it may attack any part of the body—eyes, ears, nose, throat, glands, joints, bones or vital organs.

It is now believed that many cases of tuberculosis in adults are the direct result of infection in childhood. The germs may have been taken into the body when the person was very young and have remained dormant for many years.

Boys and girls, apparently healthy, may have latent tuberculosis, without a sign of infection—no cough, no loss of weight, good color. But years later, when some extra strain is put upon the body, the symptoms appear—loss of weight, persistent cough, "indigestion" and fatigue.

When every child is properly fortified against the ravages of tuberculosis, the final victory over this deadly enemy will be in sight.



This year there will be a great forward step in the battle against tuberculosis. Efforts will be made to protect "the others"—the family and friends of the stricken person—even *before* the signs of tuberculosis show themselves, but while the disease may be latent.

Organizations for the prevention of tuberculosis—national, state and local—will warn people of the infection which may follow living in the same household or associating with one who has tuberculosis. Their action-inspiring slogan, "Early discovery—Early recovery," will be displayed on billboards, car cards and banners all over the country.

By checking tuberculosis in its earliest stages, before the germs have had time to destroy bone or tissue, tens of thousands of lives can be saved. Send for the Metropolitan's booklet, 4-J-9, "Tuberculosis". It will be mailed free on request.

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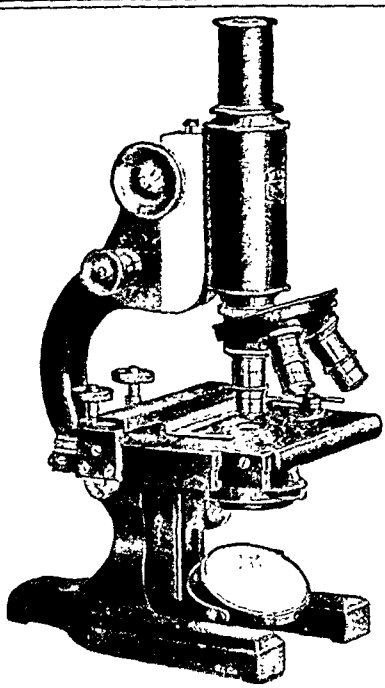
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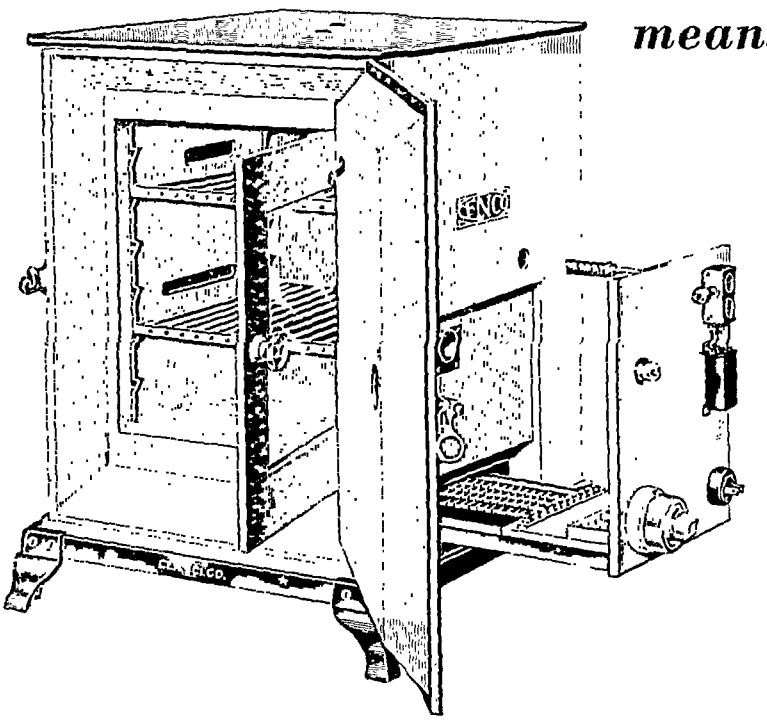
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Stimulants, Sedatives or Food ~

from a Health Standpoint



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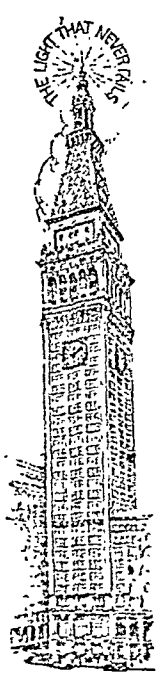
THE desire for extreme slenderness is bringing serious consequences. When stimulants, sedatives or drugs are substituted for the food needed to build health, the penalty is certain and severe—frequently broken health and sometimes death.

Half-truths are often more dangerous than falsehoods. While it is true that an excess of fat is frequently dangerous in the later years of life, it is not true that young people—under thirty years of age—can ordinarily expect to have good health if they avoid wholesome body-building foods and persist in a rigid "reducing" diet. There are certainly more cases of tuberculosis among young "underweights" than there are among those of normal weight.

During childhood and the early adult years, Nature demands a bodily reserve upon which she can draw to fight disease. In youth a few pounds of excess weight are a valuable protection against physical breakdown. The sacrifice of this needed tissue may result in permanent injury.

There is no mystery today in what constitutes an intelligent diet. The doctor who would not hesitate to prescribe a stimulant or a sedative in case of emergency, would forbid their use in place of needed foods.

A famous health expert was asked, "Do you think stimulants are harmful to everybody, no matter in what degree the stimulants are used?" He said, "Not always, but everyone should try to make himself so fit, physically, that he will not need or desire artificial stimulation. The hunger for stimulants is an indication of weakness and evidence of improper diet or other incorrect living habits."



Certain practices trick the appetite and dull the desire for food. When the demands of a normal appetite are too frequently denied, the appetite may be lost and food be made repugnant.

If the fathers and mothers of tomorrow will eat properly, exercise properly, work properly, sleep, breathe, stand, walk—yes—and *think* properly, they and their children will have better health and longer lives.

The Metropolitan Life Insurance Company has the privilege of consulting famous specialists on important health questions. While the Metropolitan wishes to point out most emphatically the danger of too strenuous dieting at the earlier ages, it also wishes to stress, no less emphatically, the danger of overweight at the older ages.

Our booklet, "Overweight," tells the best methods to control these evils. It also tells what you should weigh considering your age and height. Ask for Booklet 5A9—mailed free. Address Booklet Department, Metropolitan Life Insurance Company, New York, N. Y.

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Planning high-speed business

An Advertisement of the
American Telephone and Telegraph Company

MORE than 95% of the telephone calls from one town to another in the Bell System are now on a high-speed basis. This holds whether the call is from New Orleans to Boston or from New York to Oyster Bay.

Even if it is a long call, the operator in many cases now asks you to hold the telephone while the call is put through.

Calls from one town to another used to be handled by one operator taking your order and giving it to another group of operators to put through. You now give your call direct to the operators who put it through — and put it through fast while you are on the line. The average time for handling all toll and long distance calls in the Bell System was further materially reduced in 1928.

A high-speed service to all parts of the country—calls from one town to another as swift, clear and easy as local calls—that is the aim of the Bell System.

This is one of the many improvements in methods and appliances which are constantly being introduced to give high-speed telephone service.

Better and better telephone service at the lowest cost is ever the goal of the Bell System.

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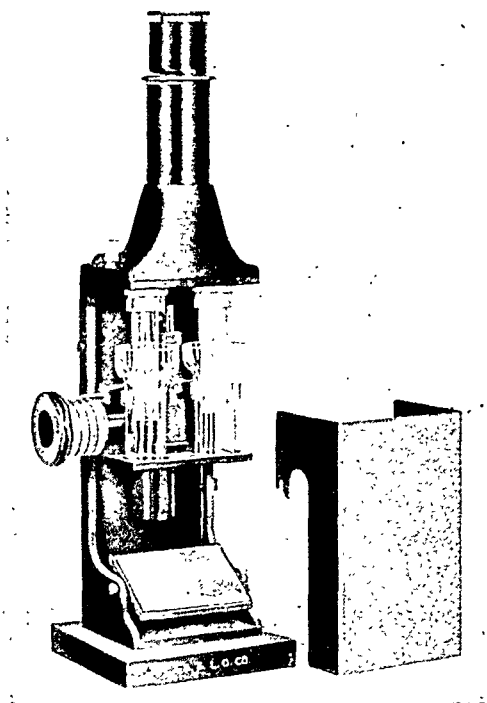
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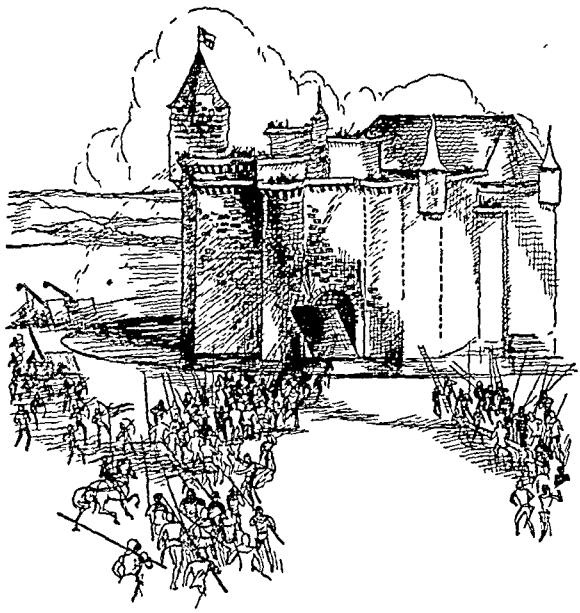
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Keep the enemy out

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TO *prevent* invasion, they used to raise the drawbridge. It was a better idea than to grapple with actual invaders.

Today, departments of health are finding that to *prevent* the invasion of disease germs is a better idea than to fight them, once they are in.

Cleanliness Institute, in enlarging its Department of Health Service, aims to cooperate with health departments and organizations in showing how cleanliness can be used to fight disease.

The Institute makes available ideas, information, and assistance in this important field. Use these helps, which emphasize greater cleanliness, to enlist the public in your drive against communicable diseases.

Communicate with the Director of the Department, W. W. Peter, M. D., Dr. P. H., or with the Associate Director, W. R. Redden, M. D.

CLEANLINESS INSTITUTE

Established to promote public welfare
by teaching the value of Cleanliness

45 EAST 17th STREET, NEW YORK, N. Y.

American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

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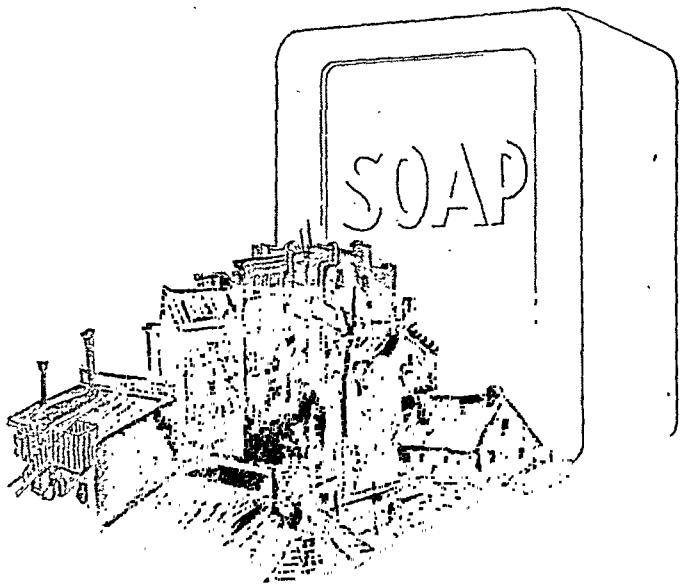
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Where the sun doesn't shine

THE purifying rays of the sun do not always reach the more crowded city districts.

But the purification of *cleanliness* is available wherever people want it. In rich homes or poor, where the sun shines or where it doesn't, soap and water can perform their cleansing health task.

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The causative organisms of 92 per cent of communicable diseases are transmitted through channels in which cleanliness is a most important preventive factor.

To assist Health Departments and organizations, Cleanliness Institute, through its Department of Health Service, makes available without expense, lectures, slides, ideas for literature, organization advice, and other aids.

For this assistance, write to the Department's Director, W. W. Peter, M. D., Dr. P. H., or to the Associate Director, W. R. Redden, M. D.

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Cancer—Ostriches

THE old notion that ostriches have the habit of hiding their heads in the sand in time of danger has been disproved again and again. Nevertheless the expression "hiding his head in the sand like an ostrich" aptly describes the man who seeks to avoid danger by refusing to recognize it when it comes.



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EACH year thousands of people die of cancer—needlessly—because they accept as true some of the mistaken beliefs about this disease.

No. 1—That every case of cancer is hopeless. *It is not.*

No. 2—That cancer should be concealed because it results from a blood taint and is disgraceful. *It is not.*

No. 3—That nature can conquer a malignant cancer unaided. *It can not.*

No. 4—That cancer can be cured with medicine, with a serum or with some secret procedure. *It can not.*

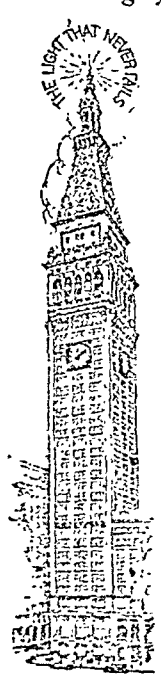
Many cancer patients are neglected or avoided because of the mistaken belief that cancer is contagious. *It is not.*

Be on Watch for First Signs of Cancer

Be suspicious of all abnormal lumps or swellings or sores that refuse to heal, or unusual discharges from any part of the body. Do not neglect any strange growth. Look out for moles, old scars, birthmarks or warts that change in shape, appearance or size.

If you have jagged or broken teeth, have them smoothed off or removed. Continued irritation of the tongue or any other part of the body is often the beginning of cancer trouble.

In its early stages, various kinds of cancer yield to skilful use of surgery, radium or x-rays. But the best doctors in the world are powerless unless their aid is sought in time.



Beware of Plausible Quacks

Because the nature and origin of cancer are largely shrouded in mystery, quacks and crooked institutions reap a cruel harvest. They prey upon the fear and ignorance of those who do not know the facts concerning cancer. They are often successful in making people believe that they have cancer when they have not. Later, with a great flourish, they boast of their "cures".

Gratefully the patients of the fakers, first thoroughly alarmed, later entirely reassured, are glad to sign testimonials with which new victims are trapped. Beware of those who advertise cancer cures.

An annual physical examination by your family physician, or the expert to whom he sends you, may be the means of detecting cancer in its early stages. Do not neglect it.

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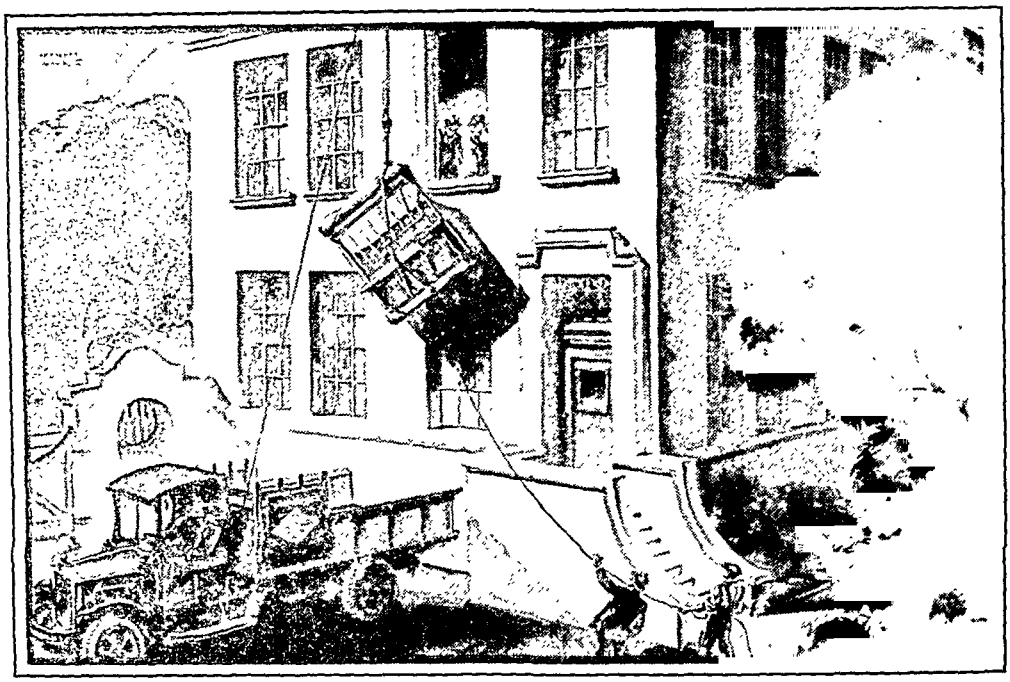
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IN THE last five years there have been hundreds of improvements of major importance in telephone central office equipment in the Bell System, and lesser improvements by the thousands. Improvements have been made in switchboard cable, in relays, in cords, in condensers, in selectors, and in the development of new and better materials for all kinds of equipment used in the central offices.

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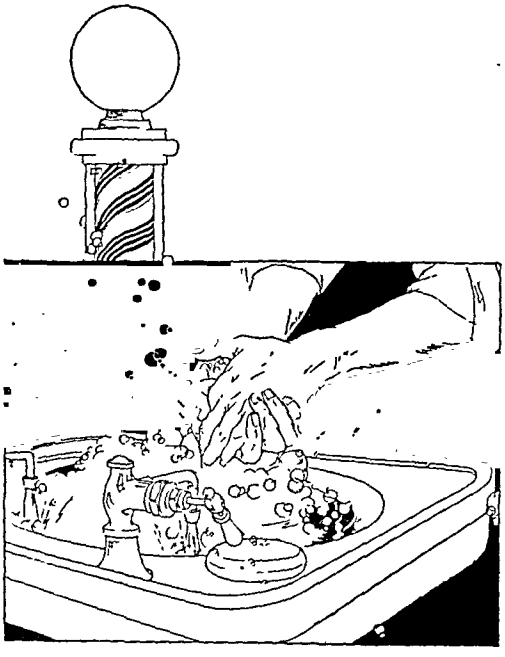
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Why not study the sanitary laws and regulations of *your* locality? And take steps to raise the requirements where necessary?

Write to Cleanliness Institute. We are prepared to cooperate.

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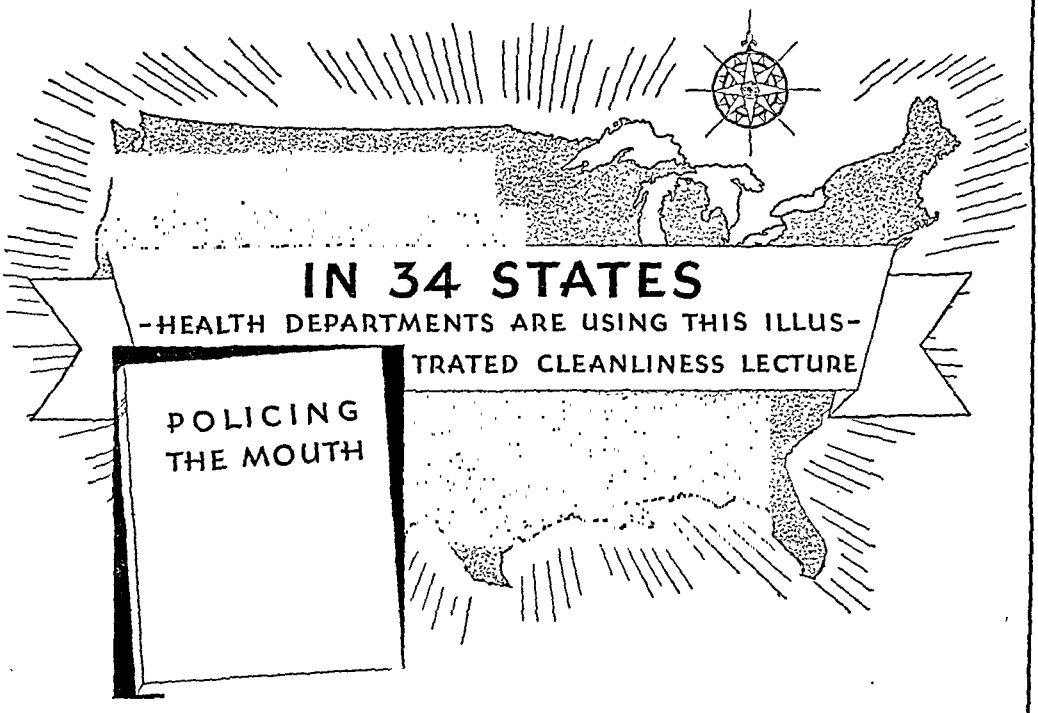
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Policing the Mouth, an illustrated cleanliness lecture, is now available on a loan basis to health officers. This lecture shows how a higher standard of cleanliness helps prevent communicable diseases from entering the system through the mouth.

It is written in simple, convincing, conversational style by W. W. Peter, M.D., DR. P.H., Director of Cleanliness Institute's Department of Health Service. It is illustrated with many fascinating slides. It is packed full of compelling statistics and facts.

Many health officials are already using *Policing the Mouth* in their educational and preventive programs. If you would like to do so, please write to the Department of Health Service.

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Common Sense

A FAMOUS doctor, said, "Many of the people who want me to diagnose and treat their ailments are more impressed by some scientific medical apparatus than by plain, common sense advice. And they are more willing to follow orders faithfully if given some special office treatment.

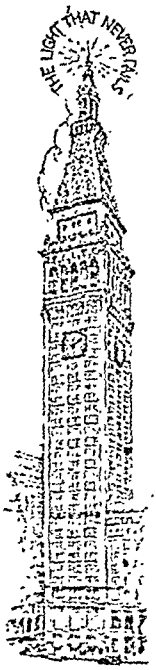
"Recently a man I know well came in looking haggard. I gave him a thorough physical examination while inquiring about his living habits. The diagnosis was clear but the patient a problem. If I had told him the simple truth that what he needed most to get back his health and strength was to slow down, sleep more, and get the proper amount of fresh air and exercise, he would have thought I did not understand the complications which were undermining his health. And if I had sent him a bill for such advice, he would have told his friends that I was a robber and not fit to practice medicine.

"So I gave him a treatment with a scientific apparatus and wrote a simple prescription. At the same time I gave strict orders as to what he should eat and drink, how many hours he might work, how long he should remain in bed, and the amount of time he should devote to outdoor exercise. To make sure that he was following my orders concerning his living habits, I had him report once a week for further observation and treatments. In a few weeks he was well. He will tell you—and he believes it—that I am a great doctor.

"Perhaps someone may say my methods with him were open to criticism. But it was my responsibility to use every means within my power to bring him back to good health. Knowing my patients as I do, I know that many of them will not obey my orders for *correct living habits* if given without special treatment or medicine. More than half of the people who consult me would not have to do so if they would learn and practice important rules of health. They expect me to cure them of physical ailments which they could easily have avoided."

A majority of cases of physical let-down and distress are caused by careless or wilful violation of health rules. Bad eating habits, too little sleep and rest, lack of fresh air and exercise, worry, self-pity are responsible for many cases of bad digestion, headaches, poor circulation, constipation, jumpy nerves, depression and run-down condition.

* * * *



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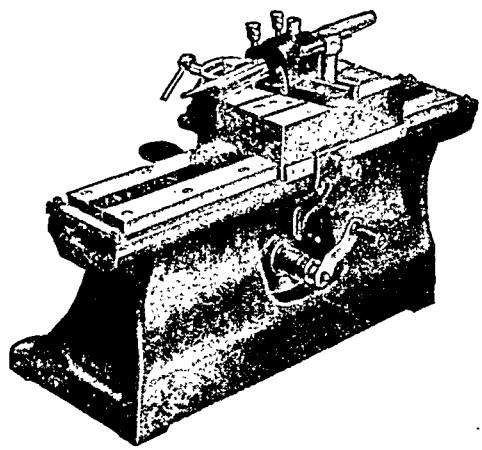
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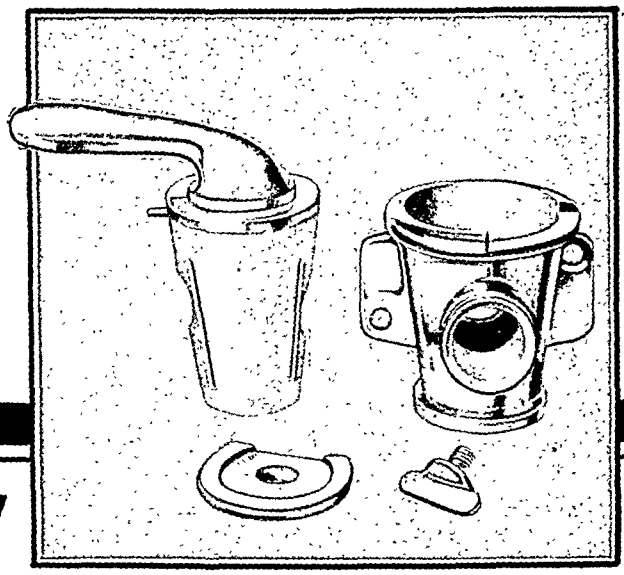
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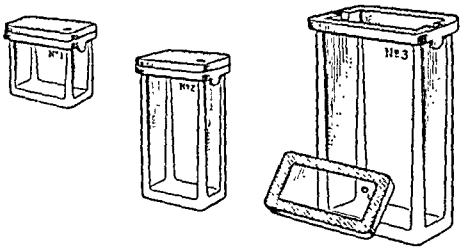
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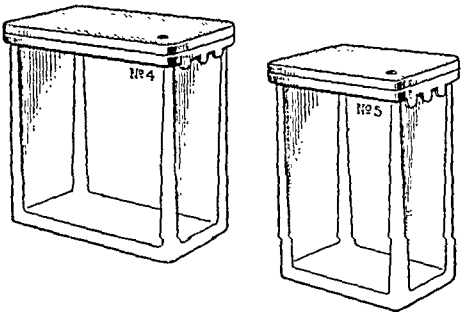
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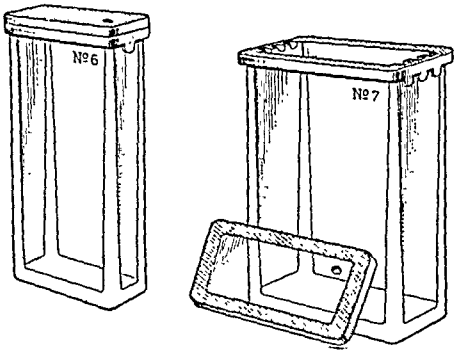
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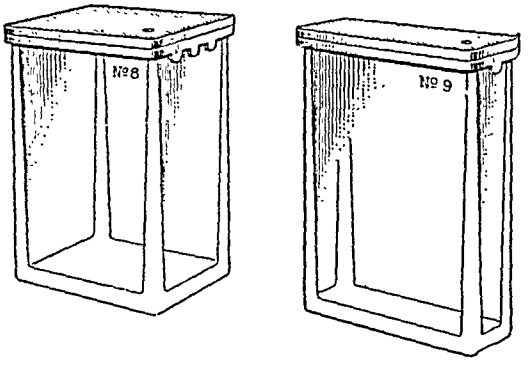
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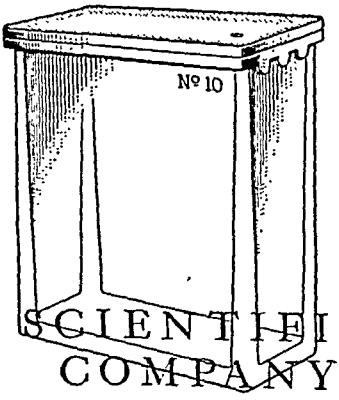
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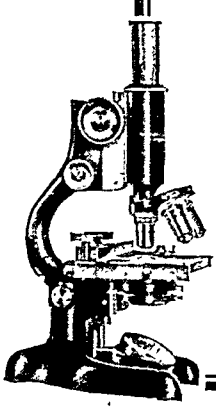
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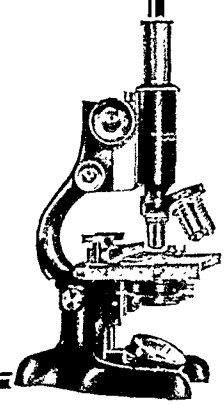
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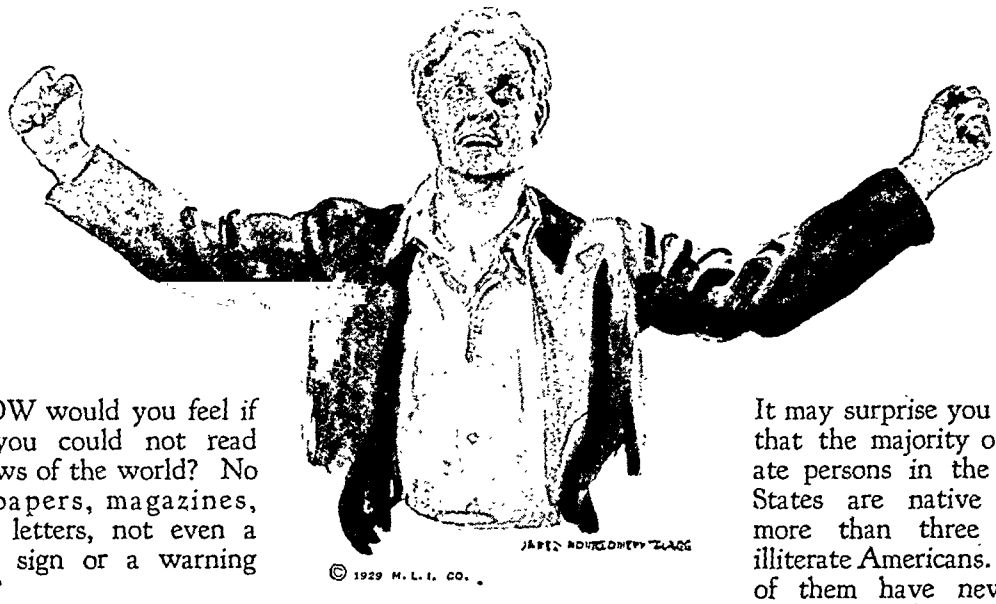
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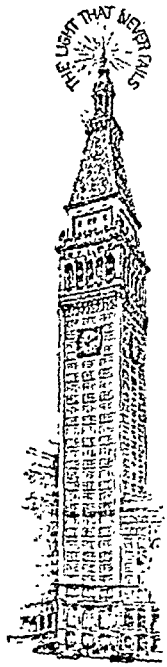
Somewhere near you is a grown person groping in the dark, in many ways helpless as a child, because he cannot read or write. You can bring sunlight into his darkened life. More than that, you may be the means of bringing him better health—even of saving his life.

"Thank God! At last I'll be able to read and write."

Today he cannot read messages on disease prevention. He does not know, unless someone tells him, the important rules of health or how to keep his family from having diphtheria, smallpox or typhoid fever. These and other preventable diseases often make illiterate localities their breeding places and thus endanger the health of the educated, despite all their precautions.

Perhaps you share the mistaken belief that it is impossible to teach grown-up illiterates how to read and write and that they are content to be illiterate.

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The line of defense

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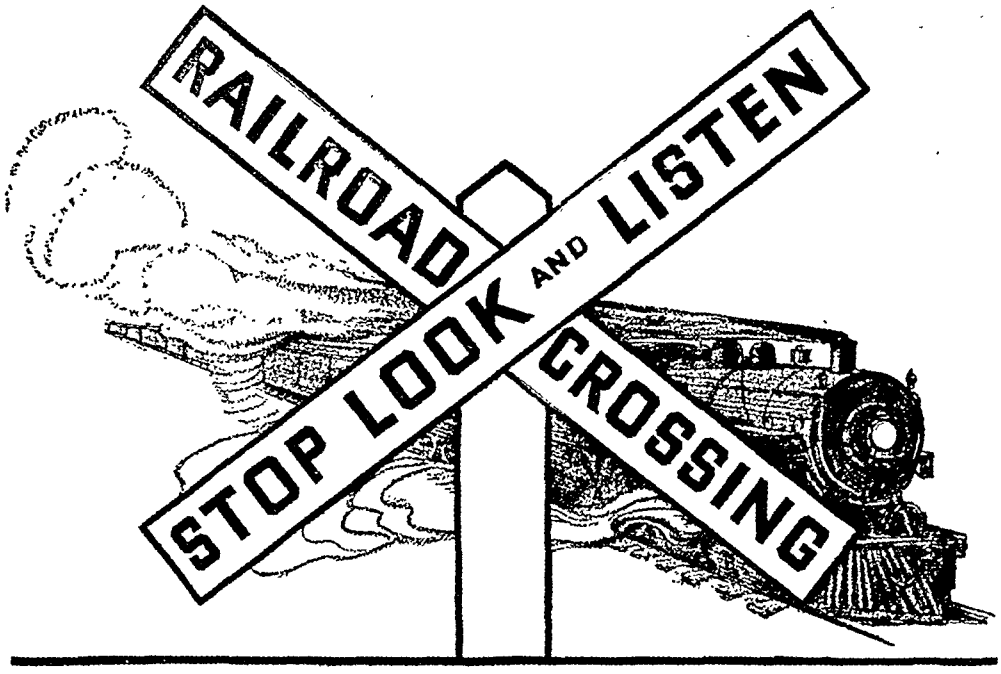
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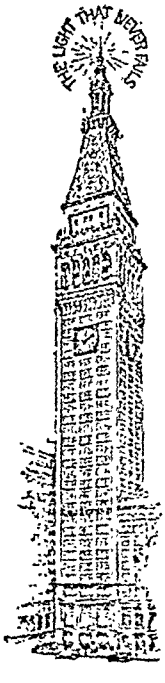
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THE warning signs, "Stop, Look and Listen," have become merely a part of the roadside landscape to many an automobile driver. Heedlessly he passes ten, twenty—perhaps fifty of them—safely. At the fifty-first comes the crash.

Last year 8,383 persons were killed outright or injured in automobile accidents at grade crossings in the United States. There are about 235,000 grade crossings in the country; more than 93% of them are unprotected.

With millions of new automobiles on the roads each year, accidents at grade crossings are increasing at an alarming rate, for the reason that most of the States have no organized program for protecting motor traffic which must cross railroad tracks.

New York, under wise leadership, has shown how to solve the problem. Before the Empire State adopted her present plan, but 10 crossings a year, on an average, were done away with. This year, the first in which the railroads, the State and communities have co-operated—the railroads paying 50% of the cost, the State 49% and communities 1%—85 death-traps are marked for immediate removal. Next year New York hopes to eliminate 150 of its worst danger spots.



Other States are becoming aroused to this terrible and needless destruction of life and property and are taking steps to prevent it. Canada, too, is taking action.

It will require many years to complete the work. It is estimated that it will ultimately cost twelve billions of dollars. But what railroads and States and communities ought to do is to begin at once with those grade crossings which should be abolished first.

Grade crossings are dangerous not only to automobilists and pedestrians, but to people who are traveling on trains. The first section of a limited train struck an automobile and killed two persons. The train stopped and the second section plunged into it, killing thirty-two passengers in the first section.

Wherever the law provides facilities for eliminating grade crossings, citizens should see that public officials perform their duty and abolish these death traps. Wherever the laws must be amended, people should meet the issue squarely and urge prompt action by legislative bodies.

There is danger at every grade crossing. Get rid of them. Copy of New York's progressive program will be mailed free on request. Address, Department 10A9.

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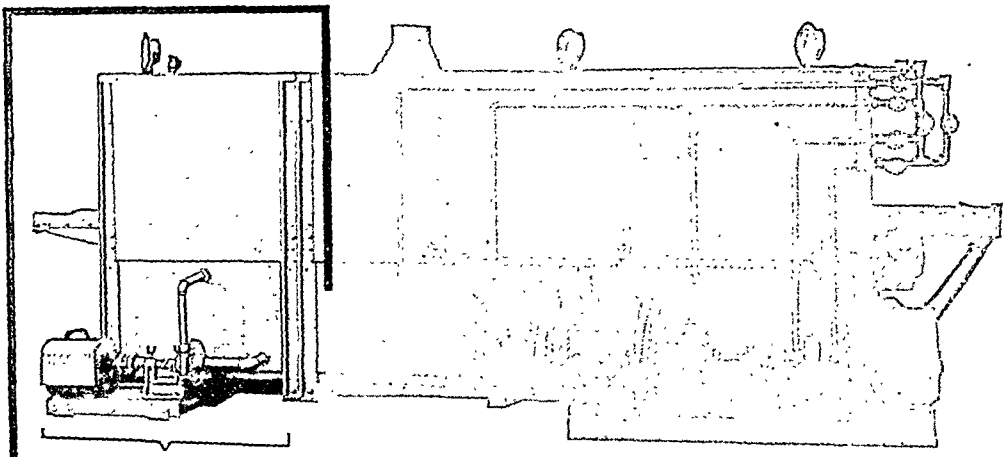
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Lucky Babies

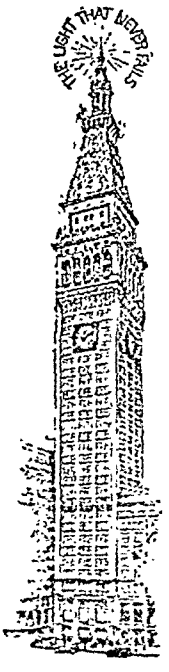
LUCKY indeed is the baby who has a mother wise enough to follow the doctor's advice—"Bring the baby to me when he is six months old and let me protect him against diphtheria. That is one disease he need never have."

Last year more than 100,000 children who were not inoculated had diphtheria. About 10,000 of them died—an average of more than one every hour of every day in the year.

Will 10,000 innocents be sacrificed next year because some doctors have failed to warn mothers or because mothers have forgotten their doctors' warning?

Even when diphtheria is not fatal, it frequently leaves its victims with weakened hearts, damaged kidneys, ear trouble, or other serious after-effects. The majority of deaths from diphtheria are of little children less than five years old. If your child, so far unprotected, has not been stricken by this arch-enemy of childhood, your good fortune is a matter of luck—not precaution. If he is more than six months old, take him to your doctor without delay and have him inoculated.

Diphtheria can be prevented by simple, painless inoculation which is lasting in its effect. Call up your doctor now and make an appointment.



Prevention of diphtheria through inoculation with toxin-antitoxin should not be confused with *treatment* of the disease by means of anti-toxin. The latter is a cure—the former prevents.

This disease has practically disappeared in many cities where the people have backed their health authorities in preventing diphtheria by inoculation with toxin-antitoxin. But diphtheria finds its victims wherever people have been misled by false reports as to the alleged danger of inoculation or have not learned to seek the protection which inoculation gives.

The Metropolitan Life Insurance Company will gladly cooperate through its local managers, agents and nurses, with State or city authorities to stamp out diphtheria. Detailed reports showing how various cities organized their successful campaigns for "No More Diphtheria" will be mailed free of charge. Ask for Booklet 11A9.

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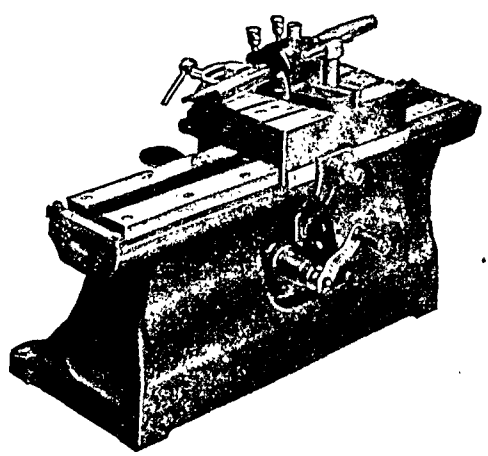
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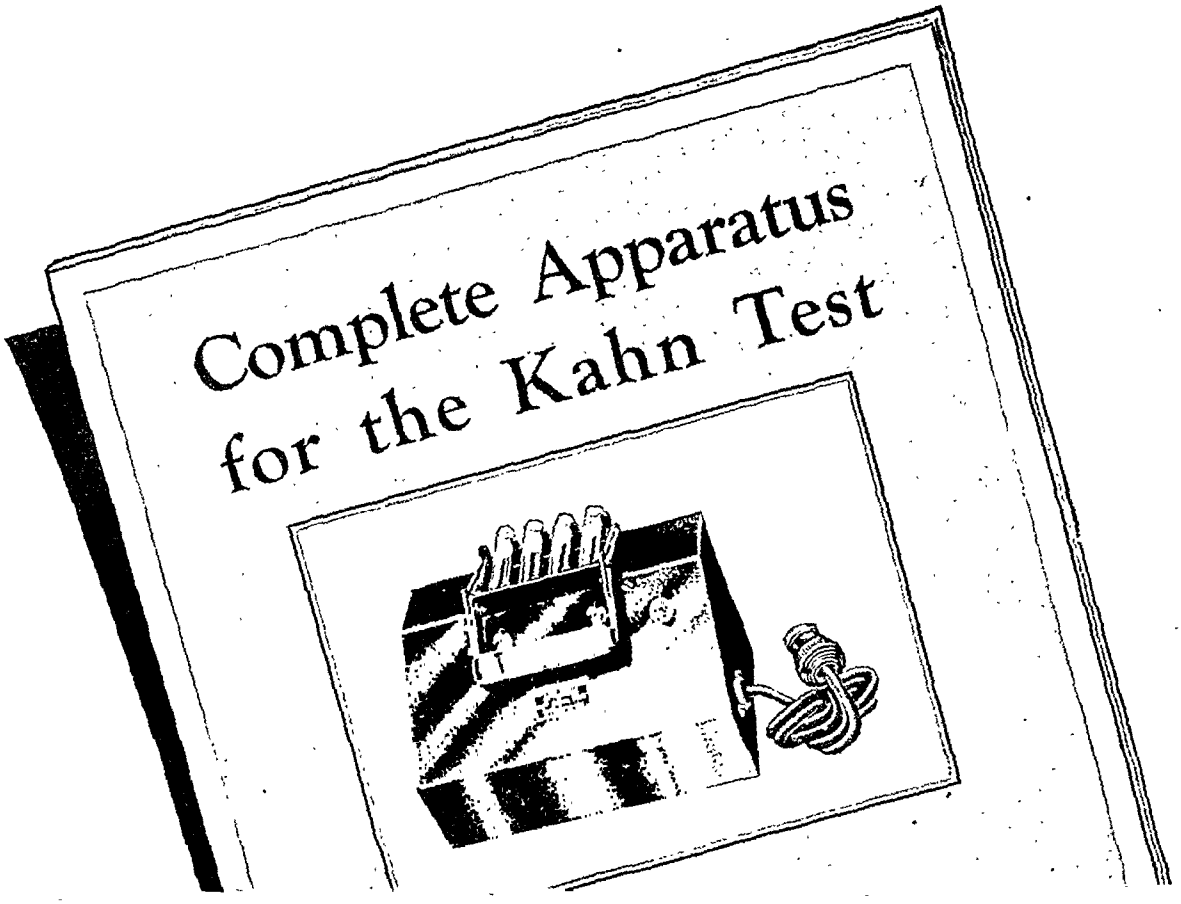
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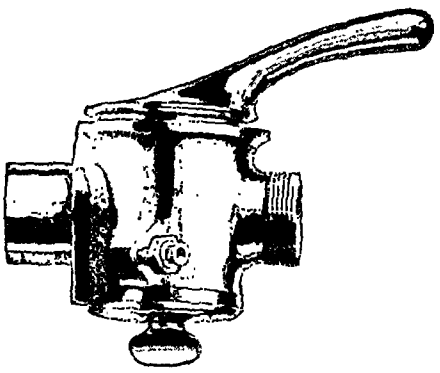
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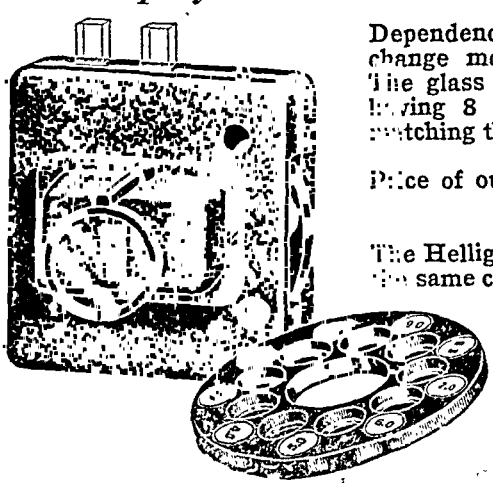
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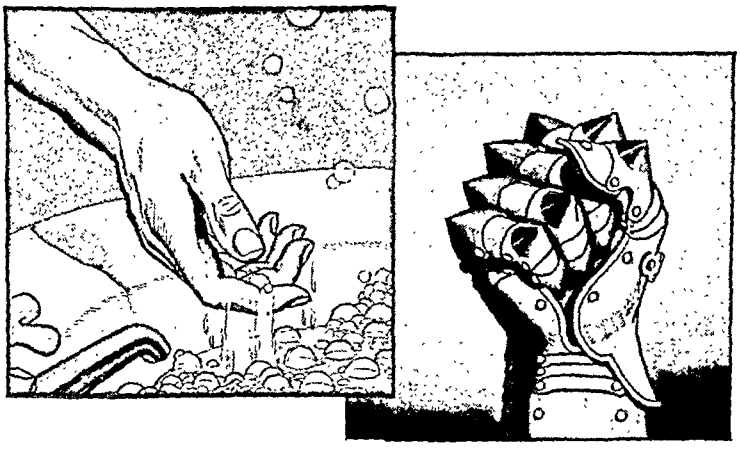
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Volume XIX January, 1929 Number 1

The Weather and the Common Cold*

THOMAS J. DUFFIELD

Executive Secretary, New York Commission on Ventilation, New York, N. Y.

IT IS the object of this paper to set forth in greater detail than has been done[1,2] the apparent relationships between the weather and the minor respiratory illnesses, commonly described as colds, as reflected in the absences reported due to this cause in three groups of school pupils during a part of the school year 1926–1927. These groups are:

1. Pupils of grades 2 to 6 in 2 mechanically ventilated schools (Danforth and Seymour) at Syracuse, N. Y.
2. Pupils of grades 2 to 6 in 2 naturally ventilated schools (Merrick and Montgomery) at Syracuse, N. Y.
3. Pupils of 48 rooms in one- and two-room rural schools in school districts 1 and 2 of Cattaraugus County, N. Y.

In the autumn of 1926, the New York Commission on Ventilation inaugurated a series of investigations of the effects of air conditions in school classrooms on the health of the pupils. During the school year 1926–1927, such studies were conducted in 3 mechanically ventilated and 3 naturally ventilated schools in Syracuse, and in 48 one- and two-room rural schools of Cattaraugus County, N. Y.

The incidence of respiratory illness among the pupils was taken as the criterion for judging the healthfulness of the air conditions in the classrooms. It was not possible to arrange for sufficient medical or nursing service either to make the determinations in the classroom or to make the necessary home visits, and, consequently, the cause of absence as reported by the parents constituted the source of information as regards absentees. The teachers recorded their own impressions concerning the prevalence of colds among the pupils in attendance at each session. The teachers also recorded four times each session the temperature as indicated by a reliable thermometer in a typical location in each classroom.

* Report to the Committee on Public Health Climatology, delivered before the Vital Statistics Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

In the Syracuse schools, differences of age and race stock of pupils were taken into consideration and eliminated as nearly as possible by limiting considerations to similar groups exposed to the different conditions created by the two types of ventilation. With this restriction, the observations in the Syracuse schools here reported relate to the pupils in grades 2 to 6, inclusive, in 2 mechanically ventilated schools —Danforth and Seymour—and in 2 schools with natural ventilation —Merrick and Montgomery.

Both boys and girls are registered in all these classes, the distribution by sex being approximately equal. The average age of the pupils in the 2 mechanically ventilated schools was 10.0 years, and in the 2 naturally ventilated schools 9.5 years. The percentage of pupils of American parentage was 71 in the mechanically ventilated schools, and 76 in the schools with natural ventilation. The number of pupils in the 2 mechanically ventilated schools was 1,086 and in the naturally ventilated schools 557.

The Syracuse study commencing November 29, 1926, and ending April 14, 1927, covered a period of 19 school weeks. It had been in progress but 4 weeks when it was interrupted by the Christmas holidays. Three weeks after these holidays were over, attendance was irregular because of the semi-annual examinations, and in the following week, the first of the second term, the records do not present an adequate picture of conditions because pupils who had not registered were not counted absent. In view of these irregularities and interruptions, it has been felt that for the purposes of this paper, consideration of these data should be limited to the period of 11 weeks from January 31 to April 14, 1927.

In the one- and two-room rural schools of Cattaraugus County, the number of pupils in the various schools was so small (the average being 18) and the pupils of foreign parentage so few in number that no attempt has been made to correct the data for these differences. Both boys and girls are registered in all these schools, which, giving elementary instruction only, are attended by pupils of approximately the same average age. The total number of pupils in the 48 classrooms was 860, and on the average (the records did not all commence and end at the same time) the study covered a period of 13 weeks of school.

In addition to studying the relationship between the types of ventilation, the air conditions in the classrooms and the incidence of colds among the pupils, the findings in each of these studies were also examined with reference to the outdoor temperature and precipitation, the weather data being taken from the records of the U. S. Weather Bureau.

DEFINITION OF TERMS

Mechanical Ventilation—Ventilation effected by means of mechanically driven supply and exhaust fans with appropriate ducts to and from each room, designed to provide each pupil with 30 cubic feet of air per minute.

Natural Ventilation—Ventilation by means of natural forces in which air change in rooms is dependent upon and effected by the difference in density of warm and cold air, and by wind direction and pressure.

Respiratory Illness—Coryza, pharyngitis, tonsillitis, laryngitis, bronchitis, pneumonia, grippe, etc. Except in those cases where a physician made the diagnosis, these terms were interpreted as cold and (or) sore throat.

Respiratory Illness Absenteeism—Absenteeism due to the above causes, expressed as a percentage of the total pupil-sessions for which the pupils were registered.

Indoor-Outdoor Temperature Difference—In order to facilitate the study of the association between outdoor temperatures and the incidence of respiratory illness among school pupils the temperature curve has been inverted. For Syracuse, the weekly mean of the outdoor temperature at 8 A.M., at noon, and at 4 P.M. on school days has been subtracted from 70° F. (the average indoor temperature).

In Cattaraugus County, where hourly outdoor temperature readings were not available, the weekly mean of the maximum and minimum temperatures has been subtracted from 70° F.

The inverted temperature curve thus shows the difference between indoor and outdoor temperatures at times when such differences, together with the conditions in the classrooms, might have a bearing on the incidence of respiratory illness among the pupils.

Precipitation—Precipitation is expressed in terms of inches of rain and (or) melted snow. In these studies precipitation has been grouped in 6 different ways, as follows:

1. Total precipitation for the 7 days ending on the Friday of the school week.
2. Precipitation on the 5 school days of the week.
3. Precipitation on the 5 school days of the week plus that over the preceding week end when such precipitation was in the form of snow.
4. Total precipitation for the 7 days of the week ending Wednesday.
5. Precipitation for the 5 school days of the week ending Wednesday.
6. Precipitation for the 5 school days of the week ending Wednesday plus that on Saturday and Sunday when such precipitation was in the form of snow.

FINDINGS

A. Syracuse

Table I shows the rates of absenteeism reported due to respiratory illness in the two groups of schools for the entire period of the study.

The mean outdoor temperatures for (1) the entire week, (2) on school days, (3) 8 A.M., noon, and 4 P.M., on school days, and (4) the daytime indoor-outdoor-temperature difference, on school days, are shown in Table II.

In Table III are given for each week: (1) the total precipitation for the 7 days ending Friday, (2) the precipitation on school days only,

TABLE I

ABSENTEEISM REPORTED DUE TO RESPIRATORY ILLNESS [1] IN MECHANICALLY AND NATURALLY VENTILATED SCHOOLS

School Ventilation Study—Syracuse, N. Y., 1926–1927 [2]

Week Ending Friday 1926	Mechanically Ventilated Schools [3]	Naturally Ventilated Schools [4]
Dec. 3	3.6	2.0
10	3.5	3.6
17	3.6	2.7
24	3.1	2.5
31	—	—
1927		
Jan. 7	3.9	2.3
14	3.6	4.5
21	2.8	3.5
28	1.6	0.7
Feb. 4	2.7	2.4
11	2.9	2.6
18	3.8	3.1
25	3.8	2.4
Mar. 4	3.0	2.1
11	2.7	1.3
18	1.9	1.0
25	2.9	1.1
Apr. 1	2.2	1.1
8	2.3	1.7
14	1.7	1.4

1. Grades 2 to 6 inclusive—Rate per 100 pupil-sessions
2. The average age, the sex distribution and the race stock of the pupils are practically identical in the two types of ventilation
3. Danforth and Seymour schools
4. Merrick and Montgomery schools

and (3) the precipitation on school days plus that over the preceding week end, when such precipitation was in the form of snow.

Table IV gives information similar to that in Table III, but in each case the period for which the precipitation is given ends on Wednesday. The essential data presented in Tables I to IV are shown in Figure I.

Coefficients of correlation between the respiratory illness absenteeism, temperature difference and precipitation have been calculated. The important ones are given in the Summary of Findings.

In addition to the demonstration of association between the variations in respiratory illness absenteeism in the mechanically ventilated schools with precipitation, and the apparent lack of relationship between the variations in the absenteeism due to this cause and the variations in outdoor temperature, by means of correlation, these same facts are brought out in a striking manner in Table V.

Of the 5 weeks in which the indoor-outdoor temperature difference exceeded the trend, i.e., weeks that were colder than the average, only 3 correspond with weeks in which the rates of respiratory illness absenteeism in the mechanically ventilated schools exceeded their seasonal trend, whereas each of these 5 weeks corresponds exactly with the weeks in which the precipitation on school days of the week ending Wednesday, plus the week-end precipitation when such precipitation was in the form of snow, exceeds the mean.

It is interesting to note that during the coldest week of the period (that ending March 4) the respiratory illness absenteeism was but 0.1 per cent above the trend value, and for the 2 weeks following (when the precipitation was low), such absenteeism was not in excess of the

TABLE II

MEAN OUTDOOR TEMPERATURE [1] AND MEAN INDOOR-OUTDOOR TEMPERATURE DIFFERENCE
School Ventilation Study—Syracuse, N. Y., 1926–1927

Week Ending Friday 1926	Mean Outdoor Temperature			Temperature Difference
	Entire Week [2]	Monday to Friday [2]	Daytime Monday to Friday [3]	Daytime Monday to Friday [4]
Nov. 26	35	36	37	33
Dec. 3	28	27	28	42
10	20	23	24	46
17	27	25	25	45
24	24	30	31	39
31	27	28	29	41
1927				
Jan. 7	23	25	25	45
14	16	18	20	50
21	26	34	35	35
28	20	17	16	54
Feb. 4	34	31	29	41
11	30	32	32	38
18	31	34	33	37
25	31	36	36	34
Mar. 4	23	21	21	49
11	39	40	41	29
18	51	49	50	20
25	36	34	35	35
Apr. 1	37	37	38	32
8	39	39	40	30
14	39	40	43	27

1. Derived from the records of the Station of the U. S. Weather Bureau, Syracuse, N. Y., through the courtesy of the Meteorologist, M. R. Sanford.
2. Mean of the daily maximum and minimum temperatures
3. Mean of the temperatures at 8 A.M., noon, and 4 P.M., Monday to Friday, inclusive
4. Indoor temperature (assumed 70° F.) less the mean of the temperatures at 8 A.M., noon, and 4 P.M., Monday to Friday, inclusive

FIGURE I

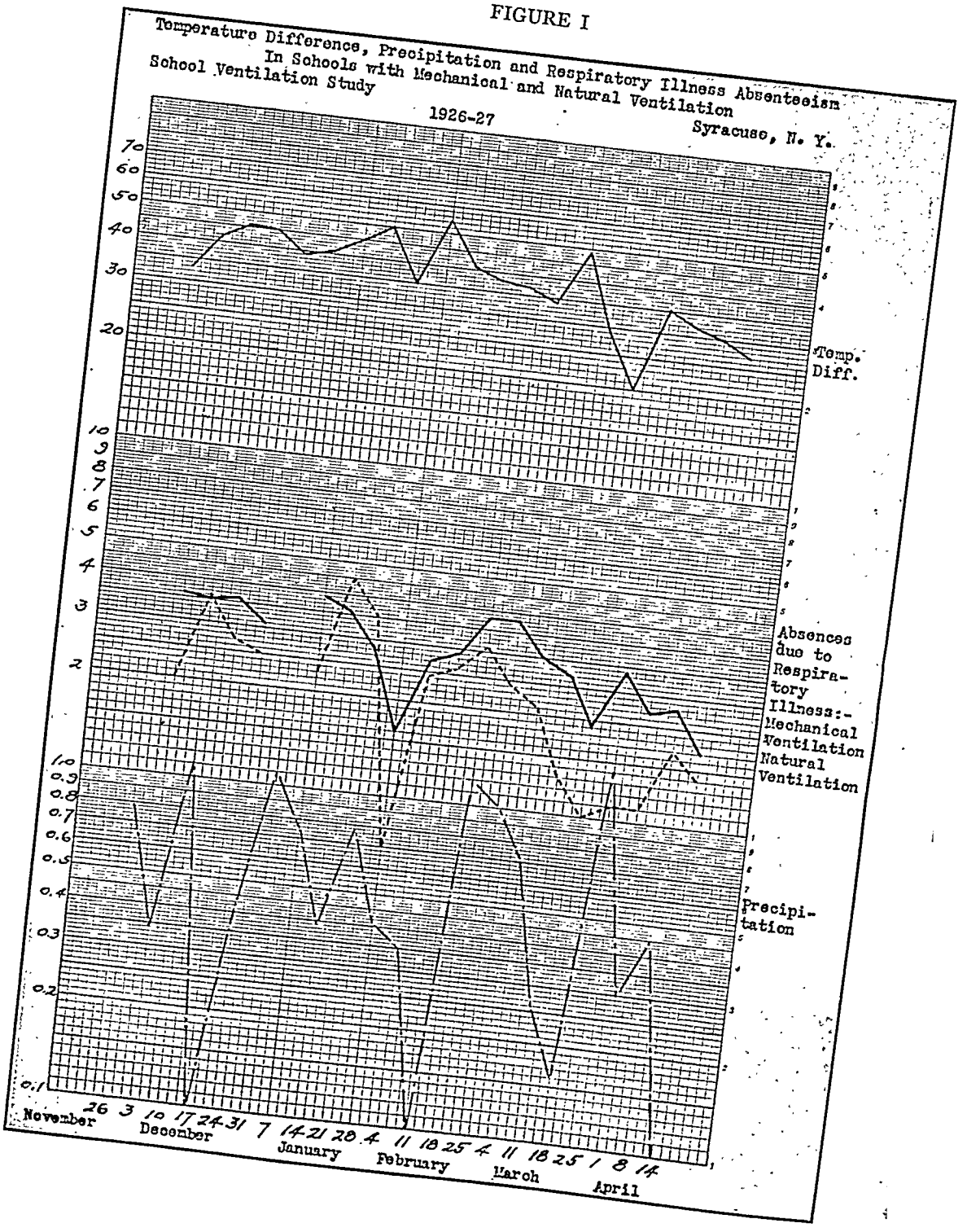

Temperature Difference, Precipitation and Respiratory Illness Absenteeism
In Schools with Mechanical and Natural Ventilation
School Ventilation Study
1926-27
Syracuse, N. Y.
Temp. Diff.
Absences due to Respiratory Illness:-
Mechanical Ventilation
Natural Ventilation
Precipitation
November
December
January
February
March
April

FIGURE II

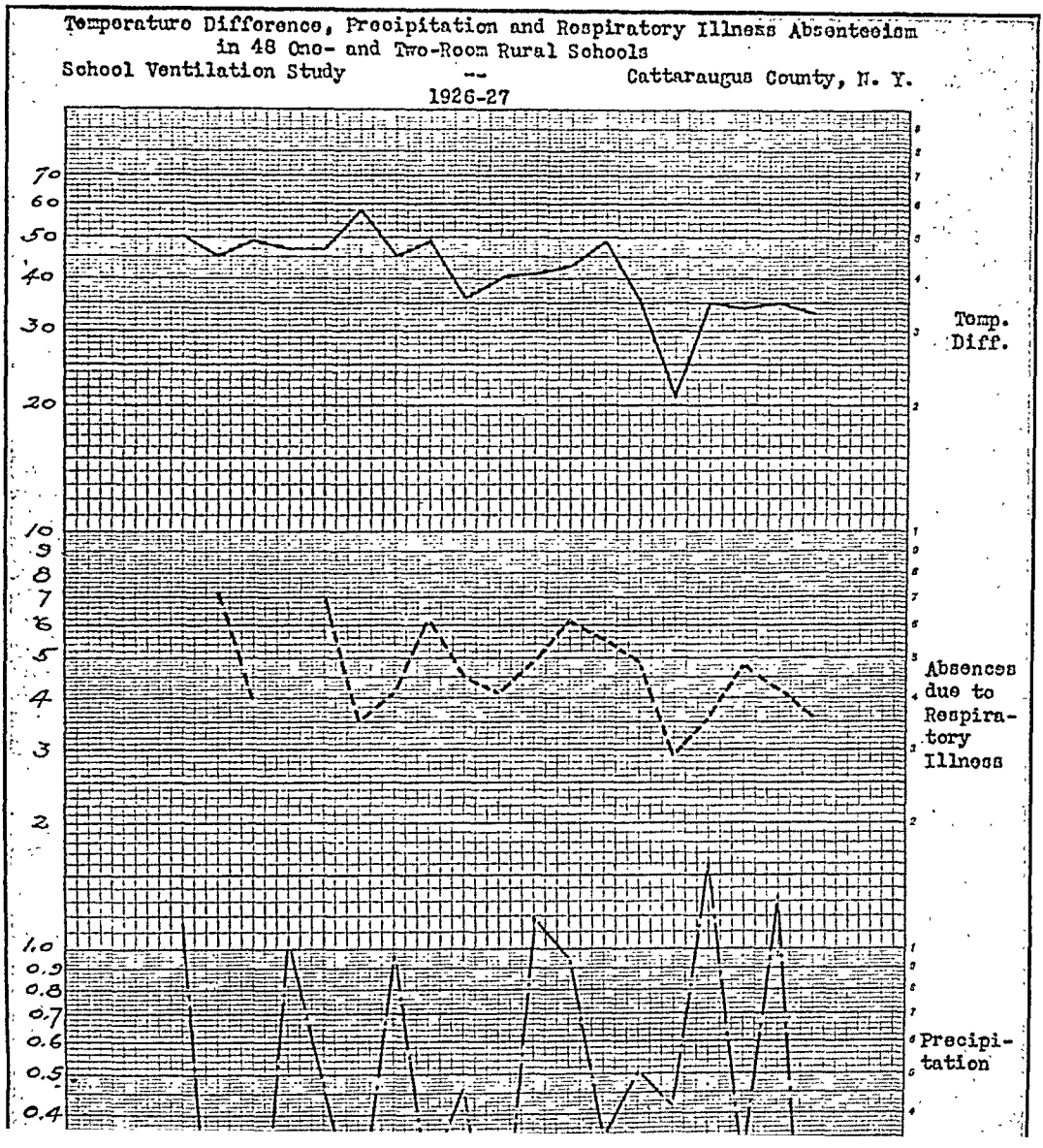

Temperature Difference, Precipitation and Respiratory Illness Absenteeism in 48 One- and Two-Room Rural Schools
School Ventilation Study -- Cattaraugus County, N. Y.
1926-27
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1.0
0.9
0.8
0.7
0.6
0.5
0.4
Temp. Diff.
Absences due to Respiratory Illness
Precipitation

TABLE III

WEEKLY PRECIPITATION, SYRACUSE, N. Y., 1926–1927 [1]

School Ventilation Study—Syracuse, N. Y., 1926–1927

Week Ending Friday 1926	Total Precipitation [2]	Monday to Friday [2]	Monday to Friday plus Saturday and Sunday when Snow fell [2]
Nov. 26	0.26	0.14	0.14
Dec. 3	0.59	0.43	0.43
10	0.99	0.30	0.99
17	0.26	0.18	0.26
24	0.27	0.27	0.27
31	1.15	0.89	1.15
1927			
Jan. 7	1.00	0.92	1.00
14	0.19	0.19	0.19
21	0.71	0.68	0.71
28	0.59	0.30	0.59
Feb. 4	0.34	0.18	0.18
11	0.18	0.01	0.01
18	1.66	1.41	1.41
25	0.92	0.26	0.92
Mar. 4	0.59	0.01	0.59
11	0.28	0.25	0.25
18	0.38	0.38	0.38
25	1.19	0.59	1.19
Apr. 1	0.70	0.36	0.36
8	0.47	0.42	0.42
14	0.00	0.00	0.00

1. Derived from the records of the Station of the U. S. Weather Bureau, Syracuse, N. Y., through the courtesy of the Meteorologist, M. R. Sanford
2. Inches of rain and melted snow

trend. Low outdoor temperatures of themselves did not appear to be associated, either immediately or remotely, with increased respiratory illness among the pupils in these schools.

In Table VI, the excesses of temperature difference and precipitation are shown, together with the excesses of respiratory illness absenteeism in the 2 naturally ventilated schools in the Syracuse study.

In this case, of the 6 weeks in which the respiratory illness absenteeism is in excess of the general trend, only 2 correspond with weeks when the outdoor temperature was below the seasonal trend, whereas excessive precipitation occurred in 4 of these 6 weeks. There was, then, it appears, a closer relationship between precipitation and respiratory illness absenteeism in these schools than between such absenteeism and low outdoor temperatures.

TABLE IV

WEEKLY PRECIPITATION, SYRACUSE, N. Y., 1926–1927 [1]

School Ventilation Study—Syracuse, N. Y., 1926–1927

Week Ending Wednesday 1926	Total [2]	School Days Thursday to Wednesday	School Days Thursday to Wednesday when Snow fell [2]
Nov. 24	0.91	0.79	0.79
Dec. 1	0.50	0.34	0.34
8	1.12	0.43	1.12
15	0.10	0.02	0.10
22	0.41	0.41	0.41
29	1.10	0.84	1.10
1927			
Jan. 5	0.75	0.67	0.75
12	0.39	0.39	0.39
19	0.78	0.75	0.78
26	0.41	0.12	0.41
Feb. 2	0.51	0.35	0.35
9	0.23	0.06	0.06
16	1.44	1.19	1.19
23	1.01	0.35	1.01
Mar. 2	0.72	0.14	0.72
9	0.29	0.26	0.26
16	0.16	0.16	0.16
23	1.41	0.81	1.41
30	0.64	0.30	0.30
Apr. 6	0.50	0.45	0.45
13	0.03	0.03	0.03

1. Derived from the records of the Station of the U. S. Weather Bureau, Syracuse, N. Y., through the courtesy of the Meteorologist, M. R. Sanford
2. Inches of rain and melted snow

TABLE V

INDOOR-OUTDOOR TEMPERATURE DIFFERENCE, PRECIPITATION AND RESPIRATORY ILLNESS ABSENTEEISM IN GRADES 2 TO 6 OF TWO MECHANICALLY VENTILATED SCHOOLS—DANFORTH AND SEYMOUR—JANUARY 31 TO APRIL 14, 1927

School Ventilation Study—Syracuse, N. Y., 1926–1927

Week Ending Friday	Excess: Indoor-Outdoor Temperature Difference Over Trend	Excess: Observed Respiratory Illness Absenteeism Over Trend	Excess: Precipitation (No. 6) Over 0.40 inch
Feb. 4	0.6	—	—
11	—	—	—
18	—	0.7	0.79
25	—	0.8	0.61
Mar. 4	13.9	0.1	0.32
11	—	—	—
18	—	—	—
25	3.8	0.5	1.01
Apr. 1	2.1	—	—
8	1.4	0.1	0.05
14	—	—	—

TABLE VI

INDOOR-OUTDOOR TEMPERATURE DIFFERENCE, PRECIPITATION AND RESPIRATORY ILLNESS ABSENTEEISM IN GRADES 2 TO 6 OF TWO NATURALLY VENTILATED SCHOOLS—MERRICK AND MONTGOMERY—JANUARY 31 TO APRIL 14, 1927
School Ventilation Study—Syracuse, N. Y., 1926–1927

Week Ending Friday	Excess: Indoor-Outdoor Temperature Difference Over Trend	Excess: Observed Respiratory Illness Absenteeism Over Trend	Precipitation (No. 6) Over 0.40 inch
Feb. 4	0.6	—	—
11	—	0.1	—
18	—	0.8	0.79
25	—	0.2	0.61
Mar. 4	13.9	0.1	0.32
11	—	—	—
18	—	—	—
25	3.8	—	1.01
Apr. 1	2.1	—	—
8	1.4	0.5	0.05
14	—	0.4	—

B. Cattaraugus County

Table VII shows the mean outdoor temperature, the mean indoor-outdoor temperature difference (70° F. minus the mean outdoor temperature), the absenteeism reported due to respiratory illness and the total precipitation for each week of the study.

Inasmuch as the study of the relation between weather conditions and the incidence of colds among the pupils was supplementary to the investigation of the effects of air conditions in the schoolrooms—there being no essential difference in the method of ventilation of the various schools and consequently no attempt to demonstrate a differential effect of outdoor weather conditions under different methods of ventilation, as was the case in Syracuse—the weather data presented in Table VII relate to the entire week ending Friday and are not restricted simply to school days.

This information was taken from the reports of the U. S. Weather Bureau and is based on temperature observations at the Allegany State Park and on the precipitation recorded at Olean, N. Y. Both of these points of observation are within Cattaraugus County and are the Weather Bureau stations nearest the schools included in the study.

Maximum and minimum temperature readings are taken but once daily, and this prevents the detailed consideration of daytime temperatures that was possible for Syracuse where the hourly observations are available.

Similarly, differentiation is not made in the published reports of the data furnished by the coöperative observer at Olean between precipitation in the form of snow and that as rain. Much of the winter time precipitation in Cattaraugus County is snow which remains on the ground for considerable periods, and the pupils have to go through it morning and night on their way to and from school.

The information given in Table VII is presented graphically in Figure II.

TABLE VII

TEMPERATURE DIFFERENCE, PRECIPITATION AND RESPIRATORY ILLNESS ABSENTEEISM IN ONE- AND TWO-ROOM RURAL SCHOOLS—CATTARAUGUS COUNTY, N. Y., 1926–1927

Week Ending	Mean Outdoor Temperature	Mean Indoor-Outdoor Temperature Difference	Respiratory Illness Absenteeism	Total Precipitation
1926				
Dec. 10	20	50	—	1.13
17	25	45	7.2	0.04
24	21	49	3.9	0.09
31	23	47	—	1.04
1927				
Jan. 7	23	47	7.0	0.47
14	12	58	3.5	0.22
21	25	45	4.1	0.96
28	21	49	6.2	0.28
Feb. 4	34	36	4.5	0.46
11	30	40	4.1	0.14
18	29	41	4.9	1.18
25	27	43	6.1	0.95
Mar. 4	21	49	5.5	0.35
11	35	35	4.9	0.51
18	49	21	2.9	0.42
25	35	35	3.6	1.57
Apr. 1	36	34	4.8	0.31
8	35	35	4.2	1.32
15	37	33	3.6	0.00

Examination of this chart shows that the general trends in the two curves of temperature difference and of respiratory illness absenteeism are of the same character, but the fluctuations of the latter do not closely correspond with variations in the temperature difference. It will be seen, however, that, with but one exception, whenever the precipitation exceeds the mean, the following week shows an excess of respiratory illness absenteeism. See Table VIII.

Comparison of the data in columns 1 and 2 of Table VIII shows that of the 7 weeks in which temperatures were below the seasonal

average (trend line), only 4 correspond with weeks in which the respiratory illness absenteeism is above the average trend. On the other hand, 5 weeks which show an excess of respiratory illness have outdoor temperatures above the average. What is perhaps more striking is the fact that during the coldest week of the study period, i.e., when the indoor-outdoor temperature difference is greatest (that ending January 14, 1927), respiratory illness absenteeism was far below the average for the period as determined by the general trend.

The second coldest week of the study period was that ending March 4, when the outdoor temperature averaged 20° F., 7 degrees colder than the preceding week. Despite this temperature drop, the excess of respiratory illness absenteeism declined to two-thirds that of the previous week.

TABLE VIII

INDOOR-OUTDOOR TEMPERATURE DIFFERENCE, PRECIPITATION AND RESPIRATORY ILLNESS ABSENTEEISM IN 48 ONE- AND TWO-ROOM RURAL SCHOOLS—DECEMBER 6, 1926, TO APRIL 14, 1927

School Ventilation Study—Cattaraugus County, N. Y.

Week Ending Friday	Excess		
	Indoor-Outdoor Temperature Difference Over Trend	Observed Respiratory Illness Absenteeism Over Trend	Precipitation During Week Over Mean
Dec. 10	—	—	0.46
17	—	1.6	—
24	—	—	—
31	—	—	0.37
Jan. 7	—	1.7	—
14	11	—	—
21	1	—	0.29
28	4	1.2	—
Feb. 4	—	—	—
11	—	—	—
18	—	0.2	0.51
25	3	1.5	0.28
Mar. 4	10	1.0	—
11	—	0.5	—
18	—	—	—
25	—	—	0.90
Apr. 1	—	0.7	—
8	3	0.2	0.65
14	2	—	—

Comparing the data in columns 2 and 3 of Table VIII shows that excessive precipitation (above the mean) is followed, 6 times out of 7, by excessive respiratory illness absenteeism in the following week, the only exception to this rule being the last week of the study. Of the

other 3 weeks to show an excess of respiratory illness absenteeism, 2 follow weeks with excessive precipitation with a lag of 2 weeks. The remaining week to show respiratory illness in excess (0.2 per cent) of the trend line value is that ending February 18, 1927, a week during which the precipitation was practically double that of the mean, the effect on the incidence of respiratory illness showing more promptly than usual.

Although the correlation coefficients involve the magnitude as well as the correspondence in the deviations, they amply support the suggestion from the Syracuse Study that fluctuations in respiratory illness (as reflected in the absenteeism reported due to this cause) are closely associated with precipitation.

SUMMARY OF FINDINGS

1. In these studies, the curves of respiratory illness absenteeism follow the same *general* trend as does the curve of difference between the weekly mean indoor and outdoor temperatures (see Figures I and II).

2. In the 2 mechanically ventilated schools, there appeared to be a high degree of relationship between the variations in the respiratory illness absenteeism and the amount of precipitation with a lag of 2 days. Correlation coefficient $+ 0.84 \pm 0.09$ (see Figure I and Table V).

3. This close relationship between precipitation and respiratory illness did not appear to hold true for the two naturally ventilated schools. Correlation coefficient $+ 0.34 \pm 0.27$ (see Figure I and Table VI).

4. In the one- and two-room rural schools of Cattaraugus County, the variations in respiratory illness absenteeism appeared to be closely associated with precipitation but with the lag of 1 week. Correlation coefficient $+ 0.64 \pm 0.15$ (see Figure II and Table VIII).

5. In none of these three groups does the variation in absence due to respiratory illness appear to be closely associated with changes in the outdoor temperature. The correlation coefficients when the parallel general trends are removed are:

1. For the mechanically ventilated schools (See Figure I and Table V)	-0.34 ± 0.27
2. For the naturally ventilated schools (See Figure I and Table VI)	-0.30 ± 0.28
3. For the rural schools (See Figure II and Table VIII)	-0.15 ± 0.24

CONCLUSIONS

1. The variations in the incidence of acute respiratory diseases in three groups of school pupils during the school year 1926–1927 appear to be more closely associated with variations in precipitation than with variations in outdoor temperature.

2. A possible explanation of this may lie in the following facts:

a. The evaporation of moisture from the shoes and clothing of the pupils is a heat absorbing process—60 b.t.u. of heat (15 kilogram-calories) being required to evaporate each ounce of water.

b. Under normal conditions of classroom occupancy, the heat required to effect this evaporation of moisture is absorbed from the pupil.

c. Unless pupils' heat production is sufficient to compensate for this abnormal heat extraction, they will be chilled either sensibly or insensibly.

3. Just how such chilling is associated with the onset of acute respiratory disease is not clear.

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1. Duffield, Thomas J. Effects of Mechanical and Natural Ventilation on the Health of School Children. *J. Am. Soc. Heat. & Vent. Eng.*, Apr., 1928.
2. Duffield, Thomas J. The School Ventilation Studies of the New York Commission on Ventilation during the School Year 1926–1927. *Am. School Bd. J.*, Jan., 1928.

Before-and-After Statistics

WE are frequently confronted with a chart showing, by the heights of two bars, the average death rates from some given cause, for 5 years before and for 5 years after the inauguration of some campaign against the disease in question. If the later 5-year average rate is appreciably lower than the earlier, it is held to be demonstrated that the program undertaken was followed by a decline in mortality from the disease combated. Such *may,* in fact, be the case; but it may not.

Inquire of the person compiling the statistics why he used the death rate over a period of 5 years, and he will reply that it was in order to " smooth out the chance fluctuations " or to " reduce the probable error." Admittedly, a 5-year death rate is less subject to " chance variations " than is the rate for a single year; especially is this true where the population concerned is small.

But it very frequently happens that this process of " smoothing out chance fluctuations " also smooths out all meaning from the data. Let us take the typical instance of Bunkville, a city which has been carrying on a campaign of publicity against typhoid fever since the beginning of the year 1923. After waiting for 5 years, wisely, in order to have sufficient data to evaluate the results of the experiment, the Bunkville Health Department published a graph, which is reproduced here (Figure I), showing that during the 5 years 1918–1922 the average typhoid fever death rate was 14 per 100,000 population; and during the 5 years following, only 11 per 100,000 population—a reduction of over 20 per cent following the inauguration of the publicity campaign.

The present writer has taken the trouble to obtain from Bunkville the statistics for the separate years composing the two 5-year periods. These data are shown in Figure II. It appears from them that the decline in mortality from typhoid took place entirely *before* the beginning of the publicity campaign, and that since the campaign was started there has been a continual increase of the rate.

One can easily demonstrate that if the situation in Bunkville had been different, the average death rate for the second 5-year period in question might have been higher than the first, and yet a very definite reduction might have taken place after the beginning of the campaign. It is also, of course, possible to construct situations in which the two 5-year averages would truthfully portray what had actually happened.

It should be apparent that the essential thing to be measured in evaluating the effects of a campaign against a disease is the change brought about in the *trend* of the mortality or morbidity rate. Thus if it could be shown that as a result of a given campaign a specific death rate which had been rising from year to year was made to fall, or to rise less rapidly, some progress might be claimed. The practical

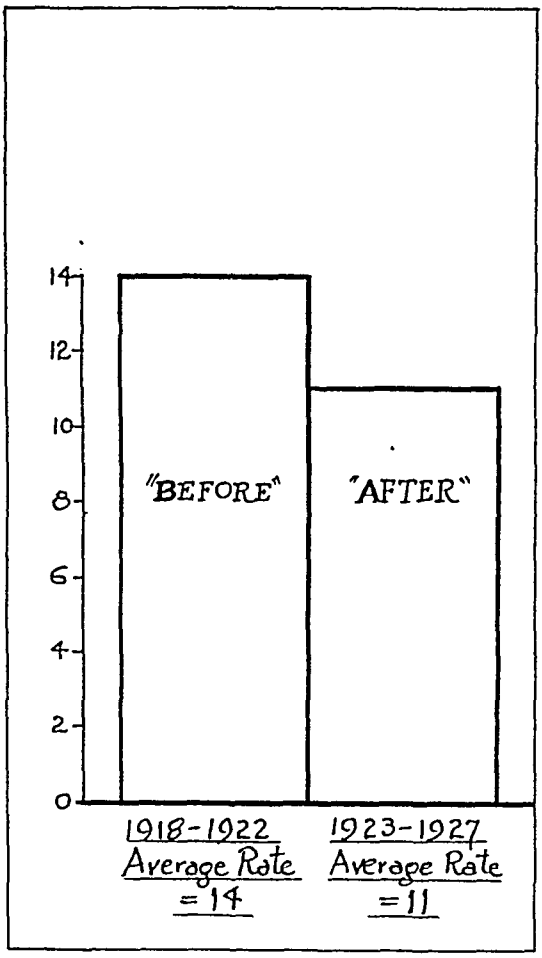


Figure I - The Story as Told by Averages.

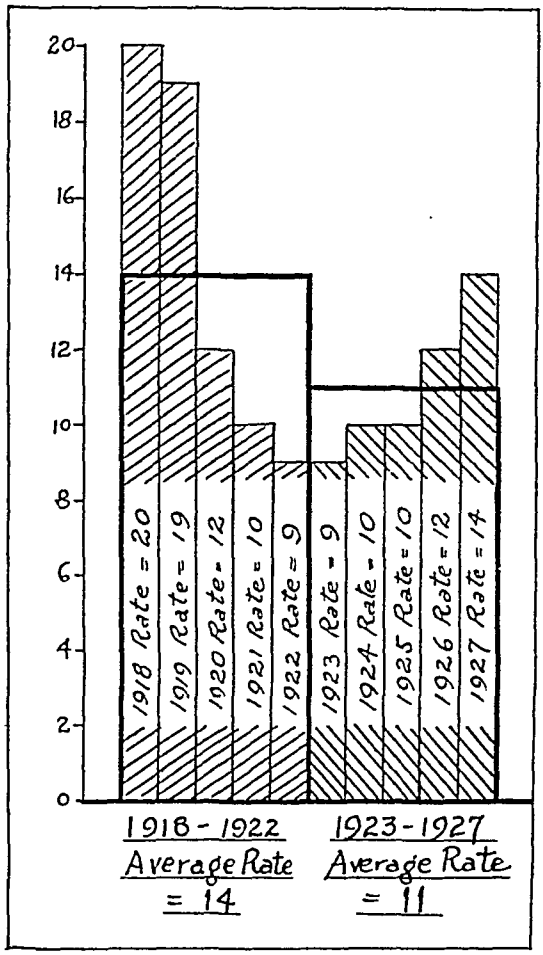


Figure II - What Actually Happened.

objection almost raises itself: But to compute a significant and reliable trend, you generally need more than 5 years' data. True! But the general use of the average death rate for 5 years before and 5 years after some event, however simple and easy of computation, is about as likely to give rise to false conclusions as to true ones. There may be legitimate uses for "before-and-after" averages for popular presentation but before using them they should be carefully examined in the light of the trends within the 5-year periods, in order to be sure that in the particular case it is certain that the true state of affairs will not be misrepresented. In fact, it is questionable whether it would not generally be preferable to show the course of a disease from year to year, even in material destined for the eyes of the "ignorant layman."—Elbridge Sibley, Nashville, Tenn.

The Possible Relationship of Mutual Benefit Associations to the Health of Employes*

H. A. SEYMOUR

Superintendent Employes Service Division, Commonwealth Edison Company, Chicago, Ill.

INSURANCE is the modern man's solution of the problem of how to avoid being wiped out prematurely by one of the hazards of life, instead of opposing them with no more than his individual strength and resources.

The first important point I wish to make is the close connection between financial aid for the average bread winner when disabled, and the time required for his recovery. It is very obvious that privation and worry due thereto delay recovery in cases lasting only a few weeks; but there must be added to that the other risk of premature return to work under the lash of necessity, resulting from lack of aid from a sick benefit association.

It is not alone the loss of income, but frequently the special expense of treatment of the disease or the non-industrial accident causing disability which makes the situation acute. Some physicians charge as low as $1.50 for attention to an ordinary case in their own offices, but this varies up to $3.00, and visits to the patient's home cost from $3.00 to $5.00 each. The cost of nursing service, beyond that available in the ordinary family, is prohibitive to all but those in the wealthy class; so that cases of pneumonia and similar diseases among wage earners are almost invariably removed to a hospital where adequate care can be obtained free or at a smaller cost.

Aside from the aid to recovery, the effect of employes' mutual benefit associations upon the health of their members is strongly preventive of avoidable disablement. That is the second big point. This is brought about by sheer necessity, because in the scheme of dues and benefits the association must plan as closely as possible. The former must be low enough and the latter liberal enough to attract healthy members and keep them. Hence, a very careful and alive

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

administration is essential; claims must be well proved before being paid; and, further, a critical view of the means employed to aid recovery is insisted upon in the interests of all. This leads directly to visits to the disabled, and inspection of home conditions bearing upon their health. It is common knowledge that no efforts in that direction have been exerted by lodges or friendly societies comparable to those which have been made by industry since the idea of its responsibility for the general welfare of its workers developed after the beginning of the 20th century. In fact in some instances, severe criticism of too stringent measures in that direction has been evoked.

We must recognize and avoid the pitfall of paternalism, especially in some of its obnoxious manifestations. But the fact remains that outside of the employer's interest and activity along those lines, the influence of a closely knit mutual benefit association, organized by and among the workers themselves, makes itself felt in the improvement of conditions both in the home of the worker and on the job.

The association has the great advantage of being in a position to refuse benefits where necessary improvements of that kind at home are wilfully neglected. As a direct result, members and their families become educated along lines vital to the maintenance of health. The requirement of a physician's certificate, periodically during the disability, forces people who would otherwise avoid the expense of medical attention to the detriment of their health, to employ a physician, even in short absences. The association's responsible officers know that long disabilities grow out of short disabilities, unless such a course is pursued. All this works toward the education of all of the employes of the industrial concern, in which the association exists, toward habits of health and adequate attention at the onset of disease.

I do not know of a single employes' mutual benefit association in which the employer is not directly interested to the extent of active participation in some way. In large concerns the medical department is a well established modern necessity from the employer's viewpoint; and the assistance in the development of such a department which the employes' association renders is another direct relationship between the association and the health of all the employes.

Well organized medical departments, and also mutual benefit associations of employes, seem to refer especially to big business; but small institutions can really do something along these lines if they will appoint some executive to study their own situations and work out a suitable plan along the lines of health maintenance, with the dual object of maintaining the best personnel efficiency and aiding in the individual welfare of employes.

In fact, in the ideal situation, the employer takes an authoritative

interest in each disabled employe's case, through the operation of rules governing employer's benefits paid (whether through the association or not) in such a way that the employe is fully aware of such payment. To my mind, that is vastly better than payment of the same annual total by the employer into the treasury of the association—an impersonal transaction. The right method improves morale and the relationship of employer and employe throughout the whole organization.

In summarizing the relationships of the mutual benefit association to the health of employes, it will be well to note certain features which appear to be disadvantageous and state the immediate answer to each.

APPARENT DISADVANTAGES

1. *The tendency toward malingering* is encouraged if benefits are too liberal; and that error should be avoided at the beginning, as it is difficult to change the basis afterward.

The general answer to this problem is that malingering is minimized by close supervision, not merely through lay-visiting, but by insistence upon reliable medical inspection, and due regard to moral hazard with reference to the known character of the disabled employe. A check on this sort of thing is to spot repeaters, and treat as recurrences frequent disabilities due to the same cause, in which case the decreasing scale of benefits removes the moral hazard.

2. *There may be an apparent increase in the sickness disability rate* shortly after a benefit plan has been put into operation among a large group of employes.

I suggest that the answer is, in part at least, that the improved health program brings to light incipient disease which must be met by enforced absence from duty, combined with adequate treatment. There is an increased health consciousness in the group, resulting, first, in the more frequent recognition of cause for absence; but if the whole system is adequate, this merely results in better actual health conditions and improved future risks. There are more complete records of health conditions, and of disability absences by kinds and causes; but I submit that it is better to know the truth than to believe, fatuously, that we were formerly better off because more ignorant.

3. *The likelihood of attracting applicants for employment not robustly healthy* and who, therefore, seek employment in business concerns known to have liberal disability benefit and other welfare plans, has been noticed by writers on the subject of employes' benefit associations.

Of course, the answer to this is careful entrance examinations to prevent the hiring of those obviously unfit, in which an important feature is the use of a proper scale of physical classification, aligned definitely with the job analysis of the concern's work. If that is well done, the entrance examination will prevent the acceptance of applicants for and transfers of employes to positions they are not physically qualified to fill.

This leaves open the subject of nervous instability, which is hard to detect by physical examination; and it must be admitted that many people are hired, especially women, by concerns having large numbers of clerks, among whom some troublesome cases of nervous disability develop.

The answer to that is adequate departmental administration. By that I mean that a department manager should learn early in the history of a case of nervous instability that he has such an employé on his payroll, and he ought to be guided by ordinary business principles to eliminate that employe at a suitable time. This policy should be followed with any employe who is in any way sufficiently abnormal to remain below reasonable efficiency after having been labored with, and after having been given genuine opportunity to improve his record. Objections that may be made to this policy are mostly sentimental, because, had the condition been detectable, the entrance examination would have prevented the employment of that applicant in the first place. The association's officers will argue for the sensible administrative policy and, if possible, see that it prevails because of their direct financial responsibility to the association.

SUMMARY OF ADVANTAGEOUS RELATIONSHIPS OF THE ASSOCIATION TO EMPLOYES' HEALTH

1. *More searching and more frequent physical examinations* of employes than will otherwise be made, both at the time of employment and later on, are induced through the association's policy and operation.

2. *Better attention to hygienic and sanitary conditions* in the employer's premises are procured.

3. *Employes are induced to obtain medical attention promptly in apparently simple sicknesses* instead of relying too much on "home remedies," thus shortening these disabilities and preventing their development into long ones (colds into pneumonia, etc.). Although this is a hard thing to accomplish, the coöperation of the association and the employer in demanding a physician's certificate of disability and of medical attention, if benefits are to be paid for short sickness disabilities, will succeed in this object.

4. *The duration of lengthy sickness disabilities is curtailed* by better medical attention, and because of less worry and privation.

5. *Complete recovery before return to duty* is not only permitted by the alleviation of the financial burdens of disability, but is enforced, the association compelling its members to obtain the medical department's discharge. Frequently the association officers, in coöperation with the industrial management, aid in finding appropriate light work, or part-time work, for those who would otherwise have to remain off duty still longer to avoid a relapse with its attendant evils.

6. *The same advantages of policy operate directly to cut down the death rate* among employes.

7. *Employes whose home living conditions are below par are encouraged to improve them,* and to seek better quarters, if necessary.

8. *The association officers will assist in obtaining adequate treatment more speedily* in lengthy cases requiring institutional care, such as tuberculosis, neurasthenia, etc.; and in obtaining, if necessary, special financial aid required for a change of climate, for example. This results in better recovery, or in enabling the member to settle in another part of the country.

9. *Health records of all employes are more completely kept,* and can be better studied and the needs of each and all understood. This enables general improvement by comparison of sickness experience with other associations throughout the country.

10. *A very definite health program, with the active coöperation of the em-*

ployer, through an adequate medical department, is included in any sound plan establishing a mutual benefit association of employes.

11. *A medical department already established is encouraged to develop its work* to the point of greatest reasonable efficiency by the required coöperation with the employes' mutual benefit association when *it* is established.

12. *The health program is stimulated where it needs it most* by establishing a competitive basis between occupational exposure groups. This can easily be done in large organizations where employes are engaged in widely different kinds of work by organizing the benefit association into sections, by such groups, with reference to disability funds only.

13. *Health-mindedness throughout the whole organization is stimulated, and good health is promoted,* by the publication of various items in the employes' magazine or newspaper illustrating the benefits of membership; and by the publication of association reports and health items prepared by the medical department.

14. *Health insurance helps to create the habits of thrift* in other directions, resulting in improved living conditions among the lower paid classes. Health makes thrift and thrift makes health.

15. In general, every well managed mutual benefit association, by contributing its quota to the health of its community, assists in the general social economic advancement of society. This country's loss of a quarter of a billion dollars annually, due to sickness, is largely a direct loss to productive industry. The more health insurance spreads throughout the nation, the greater our prosperity and the better off we shall all be.

Mobilizing Mutual Benefit Associations for Health*

MAGNUS W. ALEXANDER

President, National Industrial Conference Board, New York, N. Y.

AS originally conceived, industrial medical work was primarily curative rather than preventive. It filled a great need in industry by providing suitable treatment for the injured and sick and also by preventing, through careful treatment and follow-up, aggravation of injuries and prolonged periods of disability. But its object was essentially the repairing of the damage already done. In its advanced form, medical work in industry seeks to eliminate the cause rather than merely to mitigate the consequences of injury and illness; to hunt out and eradicate incipient disease instead of waiting for the disease to develop before attacking it. But the plant physician cannot usually accomplish this unassisted. He comes into contact normally only with those who need his services quickly, and his time is usually so fully occupied with the injured and sick that he has scant opportunity fully to develop the preventive possibilities of his position.

In establishments which have no plant physician, even on a part-time basis, there is all the greater need for some agency to assume the initiative in sickness prevention and in an effective campaign for health preservation. Fortunately, in many plants an agency appears ready at hand which can easily be adapted to just such a purpose; in others it can readily be installed. The average employe quickly responds to a proper appeal for his coöperative attitude, and in order to make and sustain an effective appeal—made more difficult by the increasing dimensions of individual industrial plants—and to secure coöperative harmony in the conduct of business enterprise, organized programs of industrial relations activities have been developed which have successfully passed through the stages of experimentation until in many establishments they have now become an integral part of administrative procedure.

THE MUTUAL BENEFIT ASSOCIATION AS AN AGENCY FOR HEALTH WORK

Among industrial relations activities, one stands out as being rather unique because it is composed of, and usually officered and operated by, the employes themselves. Mutual benefit associations, as the

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

name implies, are organized for the mutual benefit of the plant employes who have banded together in such associations and, however much or little attention and financial assistance management may devote to them, they are essentially the employes' own organization. A study of mutual benefit associations indicates that the main thought among workers in forming them, and among management in assisting their formation and conduct, has been the desire to establish a systematic coöperative means of securing for their members some measure of protection against loss due to accident, illness or death, in addition to the protection afforded by workmen's compensation laws or other means.

Broadly considered, the mutual benefit association is a mutual insurance venture in which the dues of the members and the contributions by the employer, where made, correspond to the premiums paid by policy holders to regular insurance companies, and the relief benefits of the former correspond to the insurance payments of the latter. With the recent growth of group life, and sickness and accident insurance, some of the mutual benefit associations have transferred their insurance risks to regular insurance companies, thus relieving themselves of their function of offering sickness, accident and death benefits to their members through coöperative methods.

Whether this procedure is in the interest of the employes composing the mutual benefit associations and of the associations themselves is a moot question. No doubt, it increases the certainty of benefit payments, since in the case of an insurance company, premium payments and benefit payments have a sound actuarial relationship, a fact which is not always true of mutual benefit associations.

As a matter of fact, I know of no case where a member of a mutual benefit association suffered a loss of benefits due him, for either the association fund was adequate to make the payment or the employing company made up the deficiency if it occurred. On the other hand, by transferring its insurance service to a regular insurance carrier, the mutual benefit association ceases to function for the very purpose for which it was organized, and replaces a strongly personal relationship among its members, especially in times of individual distress, by a more or less impersonal commercial proposition. Moreover, there is a question whether in the long run the mutual benefit association would not prove less expensive to its members than a regular insurance carrier, because usually the employing company, rather than the mutual benefit association, assumes the cost of administrative expense, and because experience has shown disability and death benefit requirements to be much more infrequent than actuarially determined

insurance payments are designed to provide. It is also reasonable to assume less malingering among the members of a mutual benefit association carrying its own insurance risks than among the same group of people insured by commercial insurance carriers. As already stated, this whole question, largely because of its newness, is still a debatable issue, and I wish here only to point out that, while on the one side there may be a gain in security and amount of benefit payments, there may also be on the other side considerable loss of psychological values.

But whether or not a mutual benefit association transfers its insurance risks to an insurance carrier, a new and useful field of activity is opening for these associations. Not only can a mutual benefit association be instrumental in promoting and coördinating the social and recreational activities of the employes in an establishment, and in these and similar ways serve as a valuable point of contact between management and the employes collectively, but the benefit association, organized and managed by and possessing the confidence of its members, is ideally equipped to sponsor a movement and carry through an effective program in the interest of the health of its members and their families.

REQUIREMENTS FOR EFFECTIVE HEALTH WORK

The basis of preventive health work is the physical examination through which physical defect and incipient disease can be ascertained and subjected to appropriate curative procedure. In this respect, mutual benefit association requirements for admission and maintenance of membership are far below what they could be. In a study of 382 of these associations, the National Industrial Conference Board found that the basis of membership in 58 was merely a statement by the applicant that he was in good health, while in 86 associations membership eligibility was dependent upon the results of a physical examination made by the employe's physician, a physician designated by the association, or the regular plant physician. Only 3 associations, or somewhat less than 1 per cent, provided for periodic physical reexamination.

Moreover, those associations which look to insurance carriers for payment of benefits to their members under a group insurance plan do not now require a physical examination for membership eligibility, since the original purpose of such examination—to limit the association's financial liability by excluding those likely to cause a severe drain on the treasury—no longer prevails, and under group insurance no individual physical examination is demanded.

The main purpose of the physical test in industry is to determine

the worker's fitness for a particular task, as well as to discover the more obvious symptoms of disease which may make him susceptible to accident and result in high benefit cost, or which may affect the health and safety of other employes in the plant. From the standpoint of the mutual benefit association, however, as already stated, the purpose of the physical examination, where required, is to limit the financial responsibility of the association.

In contemplating this issue, two questions arise: First, should all employes in a plant be required to join the mutual benefit association in that plant as a condition of securing and maintaining employment? and, second, should all members of the mutual benefit association be required to undergo a physical examination and a periodic reëxamination as a *sine qua non* for securing and maintaining membership?

Valid arguments can be presented on both sides of these questions. My own experience and studies lead me to the observation that it would seem unwise at the present time to introduce the feature of compulsion in either of the two cases. While it would seem desirable that at least in each industrial plant of larger size, perhaps generally in all plants in which 250 or more wage earners are regularly employed, there be a mutual benefit association, it would also seem the part of wisdom not to force the employes to join an association to which they would be compelled to make regular financial contributions, but rather to make the mutual benefit association so effective and helpful in its economical operation that at least the great majority of the employes would voluntarily join. When this much is accomplished, these employe members may then properly ask the management to enforce membership in the benefit association for all plant employes with more than a month's employment duration. The latter provision would be necessary in order to exclude casual workers.

The management could then, in turn, issue a rule to the effect that upon the request of the mutual benefit association in the plant it would in future require all new employes to join the association and abide by its rules and regulations. I know that such a scheme is in successful operation in several industrial plants. It is obviously desirable to bring all employes in a plant into the mutual benefit association, for its benevolent influence would automatically become available to all employes and the management could more appropriately utilize the association as a means of contact.

I feel that physical examination and particularly physical reëxamination as a basis of membership in a mutual benefit association should not be made compulsory at the present time, but that the association should through its educational campaign, and in close coöperation with

the management and the plant medical department, where one exists, encourage its members, in their own interest and that of their fellow workers, to subject themselves to a physical test. Such persistent educational effort, if intelligently carried on, would gradually overcome the natural reluctance of the association members to avail themselves of the benefits of a physical examination, while it should also offer an added incentive to voluntary membership in the benefit association.

If my reasoning is sound, it follows that by tactful and intelligent procedure the desired end—the inclusiveness of mutual benefit association membership in a plant and of physical examination and reexamination of all its members—will in time be accomplished without creating the opposition, with its unfavorable reactions upon the employment relation and even upon the conduct of the enterprise, that might otherwise develop.

The mere requirement of initial physical examination will place upon the mutual benefit association a considerable amount of clerical and follow-up work, and this will be many times multiplied by any enforcement of periodic physical reëxamination. Whether the mutual benefit association should develop the required clerical service, with resultant increase in the expense of operation, and change the character of the association from one of voluntary to one of paid assistants, is also a question worthy of very careful consideration.

The mutual benefit association should first of all devote its efforts toward educating and encouraging its members and other plant employes to join in an effective campaign for good health through personal hygienic and sensible living, prompt attention by competent physicians or nurses to incipient disease and injuries, proper initial physical examination and check-up reëxamination, and through other means that will lead to the same end. Moreover, the mutual benefit association should coöperate closely with the plant medical department, where such is in operation, and in conjunction with the plant physician select local physicians in harmony with its program whom it could recommend to its members for physical examinations and medical treatment. It should prepare and distribute to its members suitable health literature and arrange lectures and talks on the subject; should by other coöperative means strive to overcome the natural inertia of most people to take proper physical care of themselves; and seek to make each member an active health worker for himself, his fellow workers and his family. Where no plant physician is available, the same general procedure should be followed in coöperation

with a carefully selected local physician or a group of physicians who would be known as the association's physicians.

It would seem obvious that in a plant where a physician is regularly on duty, either for full-time or part-time service, he should make the physical examinations at the expense of the employing company, especially since in many plants, with organized medical service of larger or smaller scope, applicants accepted for employment must already have satisfactorily passed a physical test. It is becoming increasingly recognized that the employer has a right to demand such initial physical examination, in the interest of the new employe, the protection of his fellow employes, and also in the interest of the employer. The tact with which employers and their plant physicians have handled this matter has practically completely overcome the earlier antagonism. Compelling employes in service to subject themselves to periodic physical reëxamination may create a new feeling of opposition, especially if a physician engaged by the employer is to make the physical test, because of the fear of the employe that the detection of a physical defect or incipient disease would throw him out of employment. Even if the employe member of a mutual benefit association were allowed to choose another than the plant physician for his physical reëxamination, the mutual benefit association should require that the choice of the examining physician be made from a list of physicians approved by the association and that the examination be in accordance with an approved plan; otherwise the physical examination might in many cases become a mere sham. In any event, the management of a plant should proceed with due caution and tact, in order to remove all basis for fear on the part of the employes that the physical test may tend to deprive them of employment rather than to improve their physical condition. With an atmosphere of confidence thus created, members of a mutual benefit association would readily turn to the plant physician for physical examination without cost to themselves, or to a physician approved by the mutual benefit association, whose services are available at a reasonable rate.

The physical reëxamination of an employe should be different from the examination of an applicant for employment; and by making the former essentially for the purpose of applying such curative measures as will enable the employe to continue at work, much will be gained in removing the opposition to periodic examinations and in making employes seek medical assistance which will prolong their life of productive usefulness.

Experience has shown that diseases which cause the greatest amount of loss of productive time are mostly preventable. A study

conducted by the U. S. Public Health Service, based upon reports from mutual benefit associations covering 114,065 industrial workers employed in different industries in 1924, shows that 10,948 disability cases among the members of those associations resulted in lost work time of 8 days or more. The leading causes of such disability were influenza and grippe, these accounting for 18 per cent of the 10,948 sickness claims. The report states that during recent years no other diseases have been so disastrous from the standpoint of interrupted production, wages lost and cost to mutual benefit associations. For the 5-year period ending December 31, 1924, the U. S. Public Health Service found that the frequency rate of these diseases was 6.6 times that of the epidemic, endemic and infectious diseases against which health work is so largely directed. Compilation of the annual incidence rates for different diseases in disease groups for this 5-year period reveals that respiratory diseases, including influenza and grippe, pulmonary tuberculosis and diseases of the pharynx, accounted for 47 per cent of all the sickness cases. These figures indicate what could be accomplished through the practice of preventive measures which so strongly influence the incidence of these diseases.

CONSTRUCTIVE POSSIBILITIES OF MUTUAL BENEFIT ASSOCIATIONS

If the mutual benefit association is to fulfil its possibilities as a health agency, certain changes must be made in its point of view and in its operation. First of all, it must turn from an attitude of payment for disability or death to an outlook and effort for their prevention or postponement. It must realize that, while assuring its members relief when they are disabled, it will be performing a vastly greater service by preventing the need for such relief. It must recognize that, in promoting the health of its members, it is serving their best individual interests, and that the general improvement of health in the plant will also reduce benefit claims on the association and, consequently, enable individual benefits to be increased or individual membership dues to be decreased. It should encourage adequate initial physical examination and periodic reëxamination as the basis for effective prevention of disease and for conservation of health, and to this end coöperate in every practical way with the medical department of the plant, if there is one, or in connection with the plant management assume responsibility for making competent medical attention and consultation service available to its members at reasonable expense to them. It should, furthermore, coöperate in the efforts for safety of work shops and work operations toward a reduction of accidents, since disease is often greatly aggravated by the condition of the

body following accidents. In stimulating its members to the observation of practical and simple rules of health and hygiene, it should also induce them to carry this work home to all the members of the family. In particular, it should emphasize the importance of developing in the children habits that are conducive to good health in order that they may later on be enabled to undertake life's work without physical handicaps.

But even beyond the confines of the individual plants, mutual benefit associations could properly coöperate with local organizations, like chambers of commerce, and with other mutual benefit associations for the purpose of stimulating community health work and in order to have a skeleton machinery at hand which can readily function in case of a serious epidemic or a catastrophe. It may even prove advisable, as time goes on, to bring the mutual benefit associations in various industries or communities or states, or eventually in a nation-wide way, into close relationship for the purpose of making the work of the individual associations more effective and extending the joint beneficial influence as far as possible into all community life.

It goes without saying that the greatest care must be exercised by mutual benefit associations, by industrial management and in all cooperative relations here suggested, to avoid any appearance of paternalism or commercial exploitation.

DISCUSSION

Meyer Bloomfield, New York, N. Y.—Most of the mutual benefit associations were formed before the war and are stagnant today. Most of them make no mention of health in their inquiries or records. They are merely substitutes for "passing the hat" when someone dies. It is a Victorian age in which they exist. Mr. Seymour's presentations are of the big plants and large groups, but the stagnation of most of these associations is really alarming. Turning these matters over to insurance companies really does impersonalize them and it causes their value and purpose to be lost sight of. However, the insurance company scheme may be better in many situations. There are no statistics to support either side so far as I know at present. We should ask the mutual benefit association what it exists for and what dividends result from its existence in regard to health and to the prevention of disease. If you ask the foreman what to do with a man found asleep on the job he would say "fire him," but the mutual benefit association ought to inquire why he was asleep. Oftentimes the management needs a shaking up. A few months ago Mr. Hunt and others started an organization to overhaul the mutual benefit associations and we may expect results. The health responsibilities of these associations have great possibilities if developed correctly.

E. B. Hunt, Pennsylvania Railroad, Philadelphia, Pa.—Let us not permit the mutual benefit association to dry up by turning it over to an insurance company. It loses its interest. The Pennsylvania Railroad Association is a great factor in harmonious labor relations. It is now 42 years old. Its benefits and other ac-

tivities have often been increased and greatly extended. Back of everything is health. Only certain employes are compelled to take physical examinations. Last year there were 48,000 such examinations. These are required once if a person is 40 years of age or above and every year for certain persons who are 42 years of age or over. Certain objections may have existed at first but have long since disappeared. The whole procedure is welcomed by the labor organizations, whose members support it in the interest of public safety as well as the promotion of their health and well-being.

Volney S. Cheney, M.D., Armour & Company, Chicago, Ill.—We have no mutual benefit association at Armour & Company although I can see where such might possibly help. However, I believe that these matters are outside of the plant management. They are best conducted by outside agencies with certain cooperation from the plant. Let the plant see to bettering working conditions in the plant. The tendency is now for the plant to drop outside welfare work. We used to do it. We have dropped it gradually during the past 7 years. The results were good but the moral obligation was bad. Our business is meat packing first, and the health of our employes second. Our product is made up of the ability and good health of each worker. It is up to each worker to supply these. We cancel contracts if goods are not up to the requirements. We should do the same in hiring and keeping a worker. He, and not the industry, must furnish health, so far as his personal liability is concerned. The natural inertia in these matters does really exist, but the worker must expect to look after himself or lose his job. The mutual benefit association's object should be continuous and not just for certain times or things. We have the group insurance plan and thus far all has gone well. The insurance company furnishes the nursing service and coöperates with our plant medical service. The medical department should be fraternal and not paternal. Let outside agencies be paternal and do not expect such an attitude from an industrial medical department.

Eugene L. Fisk, M.D., Life Extension Institute, New York, N. Y.—A chief antidote to sickness is obtaining the individual's interest in himself. Dr. Cheney's line of demarkation is rather too sharp. There is a universality of interest; for example, if the employe is malingering, the employer is interested. I do not believe the employer can dismiss his interest in the health of each of the individual employes.

Francis D. Patterson, M.D., West Philadelphia, Pa.—I am surprised at Dr. Cheney's remark that a man who does not maintain his health should leave the industry. We are our brothers' keepers. Most of our employes do not know how to keep their health. Often they are too ignorant to know what to do and how to do it. Hence, the employer must assume certain obligations when he employs them if he is to gain the desired end in his own business. It is a folly to have a mutual benefit association and not physical examinations, including the repeating of them. It is a fool's paradise to live in ignorant bliss of disease. I recall that 21 years ago Samuel P. Gompers said that physical examinations had for their chief purpose the "firing" of men, but our answer was that no epileptics, heart disease cases, etc., could be employed or be continued to be employed on railroads, on cranes, etc. The mutual benefit association has a big opportunity.

Wade Wright, M.D., Metropolitan Life Insurance Co., New York, N. Y.—The wise employer, even as an expedient, must recognize the health responsibility he has for his employes. The mutual benefit association is a baby insurance company and, as such, is unsound (you all know that I am an insurance company man). It

is like the baby pop-stand compared with the luxurious catering establishment. In the former, mother finances the scheme. The business of an insurance company is simply to distribute cost in a sound manner. Most mutual benefit associations are very unsound and inadequate. The insurance company requires that malingering would have to be supported by a physician's certificate, and we take care to appoint honest doctors. Where health benefits are provided, they are to help prolong physical activities rather than to prolong life. The worker needs help for financial support while sick, for diagnostic facilities and associated things, and here lies the field for the mutual benefit association rather than dabbling with insurance. Through a good insurance company an employe can be put in the best hospital and receive the best facilities and care for not over $10 per capita per year, where the cost to a "white-collar" man, acting singly, would amount to $1,000. If such an average "white-collar" man were a saver, such a bill would take him 100 years to pay. If he belongs to a reliable insurance company he may get the same care for $10 a year. Our group insurance requires no physical examinations, but this is because insurance has nothing to do with physical examinations; such belong to another category than insurance.

George H. Wood, M.D., Frederick Stearns & Co., Detroit, Mich.—Dr. Cheney should have been a lawyer in Franklin's time. I am sure that compensation insurance is not in accordance with common law since primarily the worker assumed all risks. I think Dr. Cheney's reasons are logical, but we must do this so-called paternal work. Why? The average employe does not have sufficient income, and hence our efforts to help him in times of distress are really substitutes for low wages, which substitutes, however, are spent in a wise way.

Surgeon General Hugh S. Cumming, U. S. Public Health Service, Washington, D. C.—I am certain that Dr. Cheney's position and Dr. Wood's "fellow servant" ideas have quite completely disappeared in America's industrial relations.

Meyer Bloomfield—I am a lawyer and I must defend my profession. The law has learned something in a century. It is progressive and not continually primitive as many think. It is true that law learns slowly but in a century it has discarded the "fellow servant" and the "assumption of risk" ideas and many equally as bad.

Eugene L. Fisk, M.D.—It seems a paradox that what a man continually preaches he is often accused of never mentioning: I have repeated and repeated that the purpose of the Life Extension Institute is to extend the usefulness of life and not merely life itself.

Volney S. Cheney, M.D.—I want to explain my position more clearly. We get tired telling people what to do and not having them do it. We must resort to compulsion. As a matter of fact, we advance no key-man in our organization without a physical examination, but we are stressing that each man owes most to himself.

Bacteriophage From a Public Health Standpoint*

N. W. LARKUM, PH. D.

Bureau of Laboratories, Michigan Department of Health, Lansing, Mich.

DESPITE the enthusiasm which has been evidenced by most investigators who have undertaken therapeutic work with bacteriophage, the use of this principle has not spread and a study of the literature of the past two years indicates a decrease rather than an increase in its use. In seeking the cause for this decline, it is necessary to present the fundamental conceptions upon which bacteriophage therapy depends.

A substance capable, even in extremely small quantities, of killing and of dissolving the bacteria with which it comes into contact and which at the same time is harmless to animal tissues, should have an immediate application to sterilization of body cavities in which bacteria are present. Unfortunately, however, although a principle might be obtained capable of killing and dissolving, let us say, *B. coli,* its action is generally confined to the single strain of *B. coli* in question. A bacteriophage race which will attack one strain of this organism will not necessarily attack another strain. Furthermore, although dissolution can be demonstrated without difficulty, prolonged incubation of the dissolved culture results in the appearance of new growth. This growth, while still *B. coli,* will not be dissolved by the bacteriophage which at first attacked it. Such a culture is termed resistant and, although a new race of bacteriophage may dissolve it, the discovery of such a race is not always an easy matter. It has been further shown that these resistant cultures are more virulent than their susceptible ancestors or precursors. By using bacteriophage races of high virulence, however, the production of secondary cultures may be reduced, if not eliminated.

This outline is essentially the foundation upon which earlier experimenters based their hopes for bacteriophage therapy and, indeed, it is sufficiently alluring at the present time, for it contains within it the explanation for the successes as well as for the failures attending bacteriophage therapy to date. It does not require much exercise of the imagination to attribute to a weak race of bacteriophage most if

* Read before the Laboratory Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

not all of the failures in therapy. When we have reviewed the results obtained by workers using this conception as their foundation for therapeutic procedures it will, I think, be apparent that the results obtained illustrate the fundamental soundness of the theory. It should then be as attractive today as it was five years ago. If it is not, the reason can only be that the results of practice have failed to justify the hopes based on the theory. That such is not the case, but rather that unfair, biased interpretations have been derived from a failure to consider all of the evidence will become apparent as we proceed.

The infections to the cure of which bacteriophage has been applied are now rather numerous. They include bacillary dysentery, typhoid fever, cystitis and pyelitis, plague and cholera, gonorrhea, and various infections due to staphylococci and streptococci. The enteric diseases, infections of the urinary tract, and staphylococcus infections in general have received by far the most attention.

In so far as dysenteries are concerned, it must be admitted that a mere statistical study of the results reported would justify a rejection of the principle as a possible valuable agent in treatment. Critical analysis of the reports however would inject an element of doubt into this conclusion, for it would be seen that results obtained with dysenteries caused by the Shiga bacillus were better than were those where the Flexner or other strains were concerned. Furthermore, nationality of the investigators has played an important rôle in the results reported. The German investigators have obtained negative results, the French positive, while the British and North Americans have been more or less neutral. From South America, however, comes the greatest support for the principle. Although actual figures are not available, Da Costa Cruz reports very favorable results attending the widespread use of Shiga bacteriophage.

Treatment of typhoid and paratyphoid fevers gives similar conflicting results depending again upon the nationality of the users. About all that can be gained from a study of the literature is the impression that, should the reader be so unfortunate as to contract the disease, his first request would be for a potent race of bacteriophage.

In urinary infections the picture is more distinct, and the results are more clear cut. Whatever criticisms one may have as to the convincing nature of the results, it must be admitted that of those who have administered the treatment none has given an unfavorable report. Although exact figures are not available it may be estimated that several hundred treatments for urinary infections have been given with universally satisfactory results. The same remarks apply to treatment of staphylococcus infections of all types. The unanimity of the conclusions, even deducting for optimism, is striking.

With respect to the remainder of the infections mentioned above, even the most ardent advocate of bacteriophage must withhold conclusions. At most, they but add to the interest in the question.

If, in addition to the above information, one is conversant with the work now being carried on and as yet unpublished, he is likely to become convinced that the bacteriophage has inherent possibilities as a therapeutic agent. Such workers as Cowie, Rice, Caldwell, Dutton and others, although not so well known perhaps as Davison (the only worker in this country to publish an unfavorable report as a result of personal experience in bacteriophage therapy), have a great deal of work to their credit, some of which has been published in journals with limited circulation, but much of which has remained unpublished.

But I do not advocate bacteriophage for therapeutic and prophylactic purposes because I have read much about it, nor yet because I happen to know about work that has not been published. I believe in this principle because of my own experience in its use during a period of five years. Most recently I have been concerned with the application of staphylococcus bacteriophage to the treatment of furunculosis, acne, and osteomyelitis. Already a report has been published of the treatment of 66 cases of furunculosis with striking results. These have been continued, until today records are available of more than 300 cases of furunculosis, more than 50 cases of acne, 8 or 10 cases of styes, and several cases of osteomyelitis.

There is not space, nor am I prepared to give concrete data on these treatments. They will appear in due season in the literature. But the results are sufficiently striking to cause reputable physicians, men of years of experience in practice, men usually cautious in their reactions to therapeutic agents, in submitting their reports to use such adjectives as "wonderful," "striking," "remarkable." This does not warrant the wholesale distribution of bacteriophage or the sale of the agent as a new specific; I would be the last to recommend such a thing. That it does warrant continued investigation I insist.

Before passing from this question of my personal experience with staphylococcus bacteriophage, I would like to inject a consideration of the fundamental conceptions upon which this work is based. Unlike the earlier work the bases for which I have already described, these treatments were designed to bring into operation two observations made long after the discovery of the bacteriophage. I refer to the antigenic action of bacteriophage-lysed cultures, and to the antivirus of Besredka. With respect to the first, it has been shown by many investigators, notably d'Herelle, G. H. Smith, Nelson, and Arnold, that bacteriophage increases the opsonic index to an unbelievable degree

and that filtrates of bacteriophage-lysed cultures can produce all of the antibodies produced by the same cultures when killed by heat and to approximately the same degree. It is necessary, however, in stating this fact to bear in mind that in none of these experiments has the bacteriophage been separated from the bacterial proteins resulting from its action. Whether the bacteriophage or the proteins are responsible for the reactions it is impossible to say.

So far as the antivirus is concerned, it must be pointed out that here we are dealing with two factors, a product and a method. The product is a filtrate of old bacterial cultures; the method is that of local immunization; that is, the filtrates are applied directly to the tissue infected. Bacteriophage is likewise a filtrate. To what extent it is identical with antivirus is as yet undetermined, but the method of local immunization may be used with the bacteriophage as well as with antivirus.

Thus it has come about that instead of believing, as did the earlier workers, that it was necessary to have a bacteriophage capable of lysing *in vitro* the organism with which a particular patient was infected before successful therapy could be accomplished, and feeling that actual contact of bacteriophage and organism should occur in the tissue or cavity infected, I have felt that all that was necessary was to have staphylococcus protein as produced by bacteriophage inoculated into the patient, or, according to the type of infection, applied locally.

This changed conception as to the possible rôle of the bacteriophage in treatment has led to a consideration of its use in prophylaxis. Although, apparently, public health officials and workers are irrevocably committed to the use of so-called typhoid vaccines, it is debatable whether their trust is well placed. I think there will be no opposition to the statement that no biologic product for the promotion of immunity is entirely satisfactory or beyond improvement. If this is the case, nothing more is needed to justify an investigation of a substitute for the well known vaccine, while the road along which such an investigation should proceed has been suggested in the consideration of the basis for the therapeutic work with staphylococcus phage.

Lysed bacterial cultures are antigenic. Because of this fact I undertook a study of the results of human inoculations with filtrates of lysed cultures of *B. typhosus, B. paratyphosus A,* and *B. paratyphosus B,* and immediately learned that doses of bacteriophage as great as 4 c.c. could be given subcutaneously or intramuscularly without more reaction than would accompany the administration of a similar amount of saline, that is, a slightly sore arm. This is the first respect in which bacteriophage-lysed cultures differ from the usual vaccine. In about 200 injections I have not had a single reaction.

Comparative studies of response to inoculations with vaccine and with the bacteriophage lysates have been carried on for many months with the following results:

The agglutinin production following inoculation with bacteriophage lysates is practically identical with that following the vaccine inoculations although it is more rapid. Bactericidal action of the blood of those inoculated with lysate a month previous was consistently higher than that produced by the vaccine. One month after inoculation the opsonic index of the serum of those receiving the lysate was about double that of the individuals who received vaccine. The number of inoculations involved is now more than 200, about equally divided between lysate and vaccine. Much remains to be done and much has been done that I prefer not to mention at this time. Certainly the duration of this immunity, if such it may be called, is most significant.

No experiment that depends upon serological response as a determination of immunological value of an agent is adequate. Especially is this true of the bacteriophage. Such evidence as we have points to the fact that the degree of immunity resulting from use of bacteriophage is out of all proportion to the antibody response demonstrable. The bacteriophage possesses several characteristics which, could the immunity resulting from its use be shown to be even equal to that produced by the vaccine, justify, indeed demand, its substitution for that agent. These are: Freedom from reactions, a factor of inestimable value when it is considered that one of the chief objections to inoculation is the discomfort amounting to disability in some cases; the ease and cheapness of production; the variety of antigens which may be included; and the availability of the prophylactic agent as a therapeutic agent in case of epidemics.

Besides the advantage of lessening the objection to typhoid inoculations, the fact that bacteriophage lysates produce no reactions has another advantage. It is possible to give much larger doses, a fact which might serve to reduce the number of injections required.

As to the ease and cheapness of production, it is only necessary to state the methods used in these experiments to indicate possibilities:

To a gallon bottle of peptone water, three slants each of typhoid, para A and para B are added, and about 10 c.c. of bacteriophage. After 24 hours' incubation the broth is clear and is filtered to prevent the development of secondary cultures. The flask is then re-inoculated. This is repeated a third time. The amount of bacterial protein contained is thus very many times that found in a vaccine containing 2 billion organisms per c.c., while the only labor involved is the filtration—not an hour's job with a Seitz filter—and this may be omitted.

One question which may be anticipated at this point concerns the use of preservative. None has been used in the bacteriophage utilized for these experiments, and it is preferable that none be used since it destroys the possibility of using the bacteriophage for treatment. Phenol, moreover, decreases the potency of the bacteriophage without

entirely destroying it. It is possible that some other prevention for bacterial contamination may be employed.

Since the amount of bacterial protein that may be accumulated in these filtrates without causing reactions when they are injected is not narrowly limited, it is obvious that, providing the bacteriophage used will give lysis, several bacterial species might be included in the lysate. Shiga dysentery lysate, in particular, could be employed since filtrates of this organism when lysed are non-toxic. Enteritidis, indeed all of the salmonella group, might be added. The bacteriophage used is lytic for all of these organisms. Thus a single injection or at most three injections might serve to immunize against all enteric infections.

I come now to a justification of my title, "Bacteriophage from a Public Health Standpoint." To one who has given the least thought to this problem it appears that in bacteriophage we have a potential therapeutic and prophylactic agent for the control of epidemics—for the control of infectious disease. Have we not likewise a duty? The health departments of states and cities were early advocates of all of the better known and more widely used biological products; if they doubted the value of the principle, they at least gave it a fair trial. Why not then bacteriophage? I venture to state that as much justification now exists for the use of bacteriophage by the public health departments as ever existed for the use of scarlet fever toxin or antitoxin. The difference is this, that we have no bacteriophage for measles, for poliomyelitis or for encephalitis. In brief, for those diseases in the control of which we have no satisfactory or readily used cure or preventive, no bacteriophage has been developed. But does this excuse us from improving upon the agents now in use? Because furunculosis is not contagious is it less a function of the health department to promote the development of a measure which may relieve considerable suffering? Moreover, until the principle that bacteriophage or the antigens that bacteriophage makes available is accepted as applicable to the cure or prevention of any given infection there is little incentive to develop new bacteriophage. Why strive to develop a lytic principle which may be turned to the treatment of streptococcus infections if we are unable to secure a hearing for the staphylococcus bacteriophage? I only plead for a fair trial for a principle which under most difficult circumstances has more than demonstrated its potentialities. Make no hastily considered changes; put no product into general circulation; but make available the great resources at your command for the trial of bacteriophage.

Vital Statistics and the Measurement of Health Progress Fargo, N. D.

ROBERT E. CHADDOCK, PH. D., FELLOW A. P. H. A., EMMA A. WINSLOW, PH. D., and CAROLYN A. BOUDO

Research Consultant, Director of Research, and Statistician, The Commonwealth Fund Child Health Program, New York, N. Y.

PUBLIC health services in Fargo, N. D., underwent rapid expansion in 1923 following the establishment of the first of the Commonwealth Fund child health demonstrations. A full-time health officer, the first in any North Dakota community, replaced the part-time health officer of the pre-demonstration period. More public health nurses were employed, as well as a pediatrician, a health educator and (in 1927) a public health dentist.

As a means of discovering if possible the effect on the status of community health from this increased volume of public health activity, much attention has been given in Fargo to the study of vital statistics, growth changes in children, and other data which seemed likely to yield definite information as to the nature and extent of health improvement.*

In the use of vital statistics in the measurement of health progress desirable procedures in analysis and interpretation proved exceedingly difficult to formulate. Many local births and deaths are of non-residents, and whether or not they should be included in measurement tabulations was a matter of much importance. In a city with but 26,000 population, births and deaths each year are few, and variations in yearly rates have little significance as an index of health change. Complete and accurate registration extends back only a few years before the establishment of the demonstration, and as yet trends in local vital statistics can be determined with reference to only a very short period of time.

Procedures were finally worked out which seemed adapted to the analysis for measurement purposes of the type of vital statistics at

* For detailed description of demonstration organization and accomplishments, see Fargo Final Report—Part I, Five Years in Fargo; Part II, Public Health Work in Fargo; An Appraisal by W. F. Walker, D.P.H.; Part III, Serving the Child in Fargo. Copies may be secured on application to the Commonwealth Fund Division of Publications, 578 Madison Avenue, New York, N. Y.

present available. The methods used in this phase of the Fargo measurement program are described in considerable detail in order to serve the needs of public health administrators and others facing similar problems of analysis elsewhere. Certain of the more important findings from these studies are also included as illustrations of what it proved possible to learn from the analysis of vital statistics concerning recent changes in local health conditions.

Under the Vital Statistics Law in North Dakota the responsibility for the local registration of births and deaths rests with the city auditor or the village or township clerk, but in Fargo beginning with the demonstration period duplicate copies of certificates were kept on file in the office of the City Health Department. All certificates were carefully checked and physicians queried as to doubtful entries. Tabulations for monthly and annual reports were made routinely under the direction of the demonstration statistician, and these were supplemented by special studies when necessary, such as in the detailed study of infant mortality.

While the city was admitted to the U. S. Death Registration Area in the year 1916, its inclusion in the U. S. Birth Registration Area was not possible until 1924 when the whole state of North Dakota was able to qualify for admission to both the birth and death registration areas. Study of local standards in reporting, however, showed that beginning with 1920 records of both births and deaths were sufficiently complete to justify dependence upon them for measurement purposes, and tabulations similar to those for the demonstration years have been made from data in the birth and death certificates on file in the office of the State Department of Health.

Fargo is the hospital center for a large surrounding area in North Dakota and Minnesota. Within the city also are located several small institutions for unmarried mothers and dependent children where care is given to both residents and non-residents. It is therefore not surprising that the number of non-resident births and deaths during the years covered in this study has been nearly the same as resident, as shown in Table I. This proportion has fluctuated somewhat from year to year so that total rates including non-residents have not been affected uniformly by the factor of non-residence.

Total death rates and birth rates, as illustrated in Figure I, are quite different if non-residents are included or excluded. Both the birth rates and death rates when calculated with reference to residents only are about the same as recent rates for North Dakota and Minnesota. If non-residents are included, they become abnormally high.

Local observation indicates that relatively few births and deaths

TABLE I

BIRTHS AND DEATHS INCLUDING AND EXCLUDING NON-RESIDENTS
FARGO, N. D., 1920–1927

	Number			Per Cent		Rate		
	Total	Resident	Non-resident	Resident	Non-resident	Total	Resident	Non-resident
Live Births						(Per 1,000 population)		
1920....	702	443	259	63.1	36.9	31.6	19.9	—
1921....	732	497	235	67.9	32.1	32.1	21.8	—
1922....	731	513	218	70.2	29.8	31.3	22.0	—
1923....	768	517	251	67.3	32.7	32.1	21.6	—
1924....	783	500	283	63.9	36.1	32.0	20.4	—
1925....	810	486	324	60.0	40.0	32.3	19.4	—
1926....	846	492	354	58.2	41.8	33.0	19.2	—
1927....	921	508	413	55.2	44.8	35.2	19.4	—
Deaths, all ages						(Per 1,000 population)		
1920....	396	215	181	54.3	45.7	17.8	9.7	—
1921....	306	164	142	53.6	46.4	13.4	7.2	—
1922....	315	193	122	61.3	38.7	13.5	8.3	—
1923....	284	141	143	49.6	50.4	11.9	5.9	—
1924....	338	169	169	50.0	50.0	13.8	6.9	—
1925....	294	147	147	50.0	50.0	11.7	5.9	—
1926....	332	174	158	52.4	47.6	13.0	6.8	—
1927....	348	186	162	53.4	46.6	13.3	7.1	—
Deaths under one year of age						(Per 1,000 live births)		
1920....	79	54	25	68.4	31.6	112.5	121.9	96.5
1921....	60	39	21	65.0	35.0	82.0	78.5	89.4
1922....	58	42	16	72.4	27.6	79.3	81.9	73.4
1923....	31	20	11	64.5	35.5	40.4	38.7	43.8
1924....	63	38	25	60.3	39.7	80.5	76.0	88.3
1925....	32	19	13	59.4	40.6	39.5	39.1	40.1
1926....	71	35	36	49.3	50.7	83.9	71.1	101.7
1927....	43	22	21	51.2	48.8	46.7	43.4	50.8

TABLE II

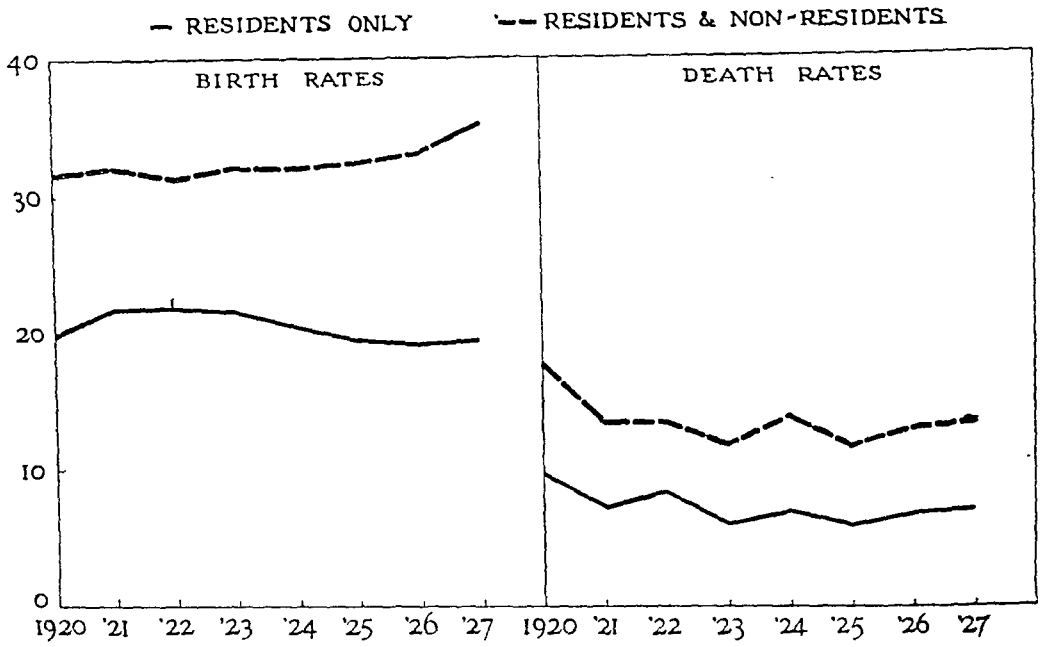
DEATH RATES BY CERTAIN SPECIFIC CAUSES WITH NON-RESIDENTS INCLUDED AND EXCLUDED
FARGO, N. D., 1920–1927

Annual Average Rates per 100,000 Population

Causes of Death (International List Numbers)	Fargo		U. S. Registration Area, 1920–1926
	Total Including Non-residents	Residents Only	
Typhoid Fever (1)	6.4	1.9	7.6
Influenza (11)	52.8	26.8	35.8
Tuberculosis (31–37)	56.5	35.3	96.5
Cancer (43–49)	124.3	68.0	88.8
Diabetes (57)	30.7	16.0	17.3
Cerebral hemorrhage and softening (74, 83)	67.4	46.0	86.2
Diseases of the heart (87–90)	134.8	86.4	172.6
Pneumonia (100, 101)	107.4	66.5	105.0
Appendicitis and typhlitis (117)	60.0	7.8	14.5
Hernia and intestinal obstruction (118)	30.1	7.0	10.7
Nephritis (128, 129)	55.3	29.9	90.7
Puerperal causes (143–150)	27.9	8.4	16.2
Congenital malformations and diseases of early infancy (159–163)	135.8	79.2	78.9
Violent deaths, suicide excepted (175–203)	69.0	32.2	82.0

FIGURE I

BIRTH RATES AND DEATH RATES INCLUDING AND EXCLUDING NON-RESIDENTS, FARGO, N. D., 1920–1927



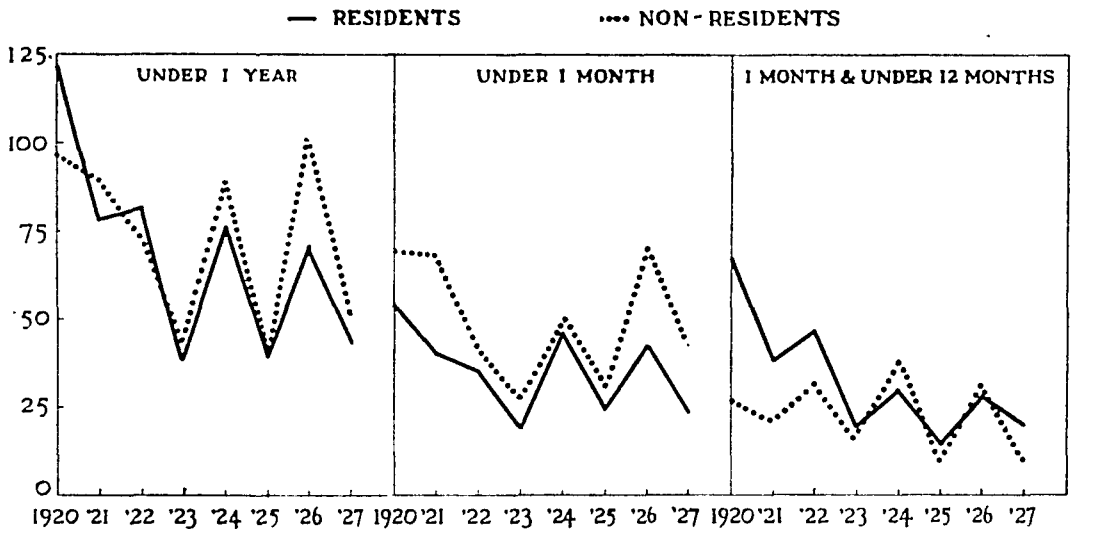
of residents occur outside. This is confirmed for deaths by the resident rates prepared by the U. S. Bureau of the Census following allocation to Fargo of deaths of residents occurring elsewhere in the U. S. Registration Area. In 1924 and 1925 these resident rates were 7.8 and 7.6 respectively—only slightly higher than the rates based on resident deaths used in this study and far below the rates including local deaths of both residents and non-residents.

Infant mortality rates calculated with reference to resident births and deaths and non-resident births and deaths also showed important differences (Figure II). Among non-residents, the total infant mortality rate tended to be higher than the resident rate, especially in the years 1924 and 1926 when both rates were considerably above those for other years in the demonstration period. For infants under 1 month, the non-resident rate was consistently high, as would be expected with the large number of non-resident births and deaths in hospitals, many of which were probably cases with threatened complications brought in from the surrounding area. For the older infants, there is less consistent difference between the non-resident rates and the resident rates.

Mortality rates for certain causes requiring operative or other special care are shown in Table II, and are especially high when non-

FIGURE II

RESIDENT AND NON-RESIDENT INFANT MORTALITY RATES, FARGO, N. D., 1920–1927



residents are included. These rates including non-residents are in most instances high in comparison with rates for the U. S. Registration Area, while resident rates are about the same or somewhat below. Other rates by cause varied less if non-residents were or were not included.

Among non-resident deaths, about 59 per cent were male and 41 per cent female. Among residents there was a smaller proportion of male deaths—55 per cent in comparison with 45 per cent for females. The proportion of male deaths among non-residents was especially high in the group of deaths due to accidental cause.

As shown in Table III, there was a larger proportion of non-resident deaths in the age groups over 5 years and under 55, while the

TABLE III

RESIDENT AND NON-RESIDENT DEATHS BY AGE, FARGO, N. D., 1923–1927

Age	Number of Deaths			Per Cent	
	Total	Resident	Non-resident	Resident	Non-resident
Total	1596	817	779	51.2	48.8
Under 1	240	134	106	55.8	44.2
1–4	87	45	42	51.7	48.3
5–9	44	20	24	45.5	54.5
10–14	32	11	21	34.4	65.6
15–19	36	10	26	27.8	72.2
20–24	51	18	33	35.3	64.7
25–34	134	57	77	42.5	57.5
35–44	132	56	76	42.4	57.6
45–54	189	77	112	40.7	59.3
55–64	211	111	100	52.6	47.4
65–74	252	139	113	55.2	44.8
75 and over	188	139	49	73.9	26.1

proportion of resident deaths was larger in the younger and older age groups.

Among non-residents 26 per cent of the births were illegitimate; among residents about 2 per cent.

It is obvious therefore that tabulations of vital statistics for residents only in Fargo are a better means of measuring health progress.

Another difficult problem in the use of vital statistics for measurement purposes was created by the small number of resident births and deaths each year. For instance, with the number of births and infant deaths in 1926 there was a standard error of 11.58 for the infant mortality rate of 71.1, and in 1927 a standard error of 9.03 for the infant mortality rate of 43.4. Fluctuations in most yearly rates have therefore limited significance in comparison with similar fluctuations in communities with larger populations.

As illustrated in Figure II, there was also a marked tendency for the infant mortality rate to vary within the demonstration period considerably in excess of the expected amount of yearly variation which might be attributed to the small number of cases. In 1924 and 1926 both the resident and the non-resident rates were nearly twice as high as in 1923, 1925 and 1927. These same differences were also present for both residents and non-residents in the mortality rates for infants under and over 1 month.

In a search for possible causes for these wide fluctuations in annual rates, all infant deaths of residents were allocated to the year when the child was born, and yearly rates were calculated on this basis. While this method reduced somewhat the amount of fluctuation, the resident rates for 1924 and 1926 still remained high in comparison with those for other years in the demonstration period.

Detailed study of causes of death during these years showed that in the 2 years with high rates the mortality from congenital causes* and from respiratory diseases among both residents and non-residents was high. In 1924 there were also more deaths from diarrhea and enteritis than in the other years. In 1926, the other high year, there were more deaths due to accidents and other external causes.

In 1923, the first year with a low rate, there were few deaths from premature birth and no corresponding increase in stillbirths from this cause. In 1925 and 1927 the low rates were apparently caused by a fairly evenly distributed reduction in the various causes of infant deaths.

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* It is interesting to note that in the year 1926 there were 13 infant deaths from comparatively rare abnormalities such as hydrocephalus, spina bifida, anencephalus, foramen ovale, etc., while in other demonstration years there were never more than 4 deaths per year from these causes.

Apparently the wide fluctuations in infant mortality rates during recent years are due to the concentration of various unrelated favorable and unfavorable factors within particular years. If these had shifted but slightly, as, for instance, if the mortality from congenital causes had not happened to be high in a year when the mortality from respiratory causes or from accidents was also high, much of the present variation in rates based on a small number of total deaths would have been eliminated.

Under such conditions neither the high nor the low rates during successive years of wide fluctuation are accurate for use in measuring changes in local health conditions or in making comparisons between local rates and those for other areas with larger units of population. Therefore, the policy finally formulated for the measurement studies was to combine vital statistics for the 5 demonstration years in an effort to eliminate accidental fluctuations in yearly rates. The same policy has also been followed in the combination of data for the 3 pre-demonstration years, the maximum period, as previously described, for which comparable data could be secured.

MEASUREMENT FINDINGS

In certain instances mortality rates as calculated in these measurement studies gave little or no definite indication of health improvement within the demonstration period. Usually these rates were based on a very small number of cases; they were related to conditions which, as experience elsewhere shows, are likely to respond slowly to preventive health measures; or the rates during pre-demonstration years were already low in comparison with those for the registration area. For example, the stillbirth rates in Fargo were 3.7 for the years 1920–1922 and 3.5 for the years 1923–1927, in comparison with corresponding rates of 4.0 and 3.9 for the registration area. The maternal mortality rate (which was based on a total of only 5 maternal deaths in 1920–1922 and 12 maternal deaths in 1923–1927) increased from 3.5 in the early years to 4.8 in the demonstration years but remained considerably below the registration area rates of 7.1 and 6.6 for these periods respectively. Tuberculosis rates were also low—33.8 and 38.6 for resident deaths in the years preceding and during the demonstration period respectively. Careful checking showed that these rates would have been increased but slightly by including the relatively few residents who died outside of the city from tuberculosis.

In other instances, however, mortality rates for Fargo residents during the demonstration years indicated fairly definitely an improvement in the status of community health.

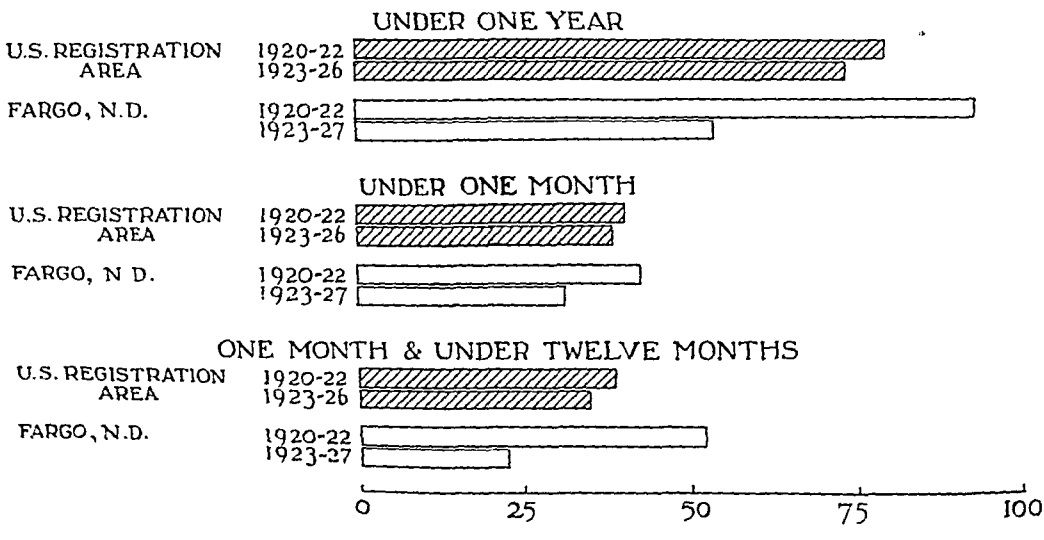
The average infant mortality rate for the years 1923–1927 was 53.5 in comparison with an average rate of 92.9 during the pre-demonstration period—a reduction of about 42 per cent. Among infants over 1 month of age the average mortality rate was reduced from 50.2 to 22.4, or by 55 per cent; for infants under 1 month of age from 42.7 to 31.3, or by 27 per cent. All these later rates for Fargo are considerably below those for the U. S. Registration Area while pre-demonstration rates were relatively high (Figure III).

Study of reduction in infant mortality rates by cause showed, as would be expected, that the reduction has been greatest in the group of causes at present especially subject to known measures of prevention and control. For instance, no infant deaths occurred among Fargo residents within the demonstration period from measles, scarlet fever, whooping cough or diphtheria, although in 1920–1922 the infant mortality rate from these causes was high in comparison with the registration area. In comparison with the pre-demonstration years the infant mortality rate from diarrhea and enteritis for the demonstration years was reduced by two-thirds; from influenza, bronchitis and pneumonia by over one-half; from congenital causes by about one-fourth. All of these reductions were considerably greater than reductions in corresponding years for the registration area.

Mortality rates for preschool children and school children have also been markedly reduced, although the small number of such deaths (see Table III) makes these changes of less significance than those in infant

FIGURE III

AVERAGE INFANT MORTALITY RATES IN FARGO, N. D., IN COMPARISON WITH U. S. REGISTRATION AREA



mortality. For children in the age group 1–4 years, the mortality during demonstration years was 430.4 per 100,000 population in comparison with 683.1 for the pre-demonstration period. For the age group 5–9 years, the demonstration rate was 172.3 in comparison with 252.3 for the pre-demonstration period; for the age group 10–14 years, the demonstration rate was 113.0 in comparison with 207.0. Here also the recent reduction was most marked with reference to epidemic, endemic and infectious diseases, diarrhea and enteritis and diseases of the respiratory system.

As pointed out by Dr. Walker in his appraisal of public health work in Fargo,* the deaths of persons under 20 years of age from certain preventable causes (typhoid fever, diphtheria, scarlet fever, measles, whooping cough, tuberculosis, diarrhea and enteritis, bronchitis and pneumonia) have shown a decrease from an annual average of 33.0 deaths in the period 1920–1922 to an average of 14.8 deaths in the period 1923–1927.

While only a relatively small number of cases are concerned in these comparisons the large difference in most of the rates between the demonstration and pre-demonstration years, the similarity in the downward trend in rates for children in different age groups and the close agreement between the reductions indicated and those occurring elsewhere where preventive health services have been organized, indicate measurable health progress during the demonstration period.

* See Part II, Fargo Final Report, p. 6.

Welfare Work for Young Workers in Austria

AUSTRIA recently celebrated the tenth anniversary of the establishment of the government welfare bureau for young workers. This bureau was organized at a time when the adverse economic conditions of the war period were beginning to affect seriously the health of the majority of the young workers. The main function of the bureau is to provide at a nominal charge vacations in the country for young workers whose health is below par. Homes for this purpose are conducted by the bureau. These homes provide proper food, outdoor exercise, and recreation under the supervision of physicians. The average stay in these homes is four weeks.

The cost of the work is met by contributions from the sickness-insurance funds, appropriations of the national and local governments, and fees paid by the young workers who take advantage of the homes.

During the 10 years of the bureau's existence, over 75,000 young workers have been cared for in the 6 rest homes.—*Lehrlingsschutz, Juggend- und Berufsfürsorge,* Sept., 1928, p. 3.

What We Do Not Know about Accidents*

R. L. FORNEY

Statistician, Public Safety Division, National Safety Council, Chicago, Ill.

ACCIDENTAL deaths will be considered in this paper, disregarding non-fatal injuries, about which our ignorance is even greater than about fatalities. I shall discuss three things that we do not know about accidental deaths: first, how many there are; second, where they occur; and third, their circumstances.

HOW MANY ACCIDENTS

It is quite true that at present we do not know how many people are killed by accident in the United States each year. There are two reasons for this: first, incomplete reporting within the U. S. Registration Area, and second, lack of reports from outside this area. The first is less important than the second, and the second is receiving more and more attention. One evidence of this attention is the slogan printed in red on the stationery of the U. S. Bureau of the Census: "Every State in the Registration Area Before 1930." I feel sure that the conditions which have prevented the remaining few states from entering the registration area will be eliminated within the next two years so that this goal can be reached. When it is reached and we can include 100 per cent of the population of the United States in the registration area, then we shall know more accurately than we do today the number of deaths from accidents, as well as other causes, in the entire United States.

WHERE ACCIDENTS OCCUR

Neither do we know where accidents occur. Two methods of classifying accidental deaths suggest themselves: first, a classification, by type, such as falls, burns, machine accidents, etc.; the other a classification by the place of accident occurrence. In general, the *International List of Causes of Death* follows the first method. With one or two exceptions the International List numbers from 175 to 196 and from 201 to 203 separate different types of accidental injury. An exception to this method is classification 186 A, traumatism in mines;

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-seventh Annual Meeting, at Chicago, Ill., October 16, 1928.

another is 186 B, traumatism in quarries. In these two instances the second method of classification has been followed, namely, a classification by the place of accident occurrence. In other words, an accident in a mine may be a burn, a fall, a machine accident, or other kind. All of these, however, would be classified in 186 A—mine accidents.

This classification by type of injury is quite essential. It supplies information of great practical importance. Its sufficiency as a method, however, must be considered in the light of the fact that statistics covering accidental deaths are not collected for the purpose of discovering what occurred in the past, but for determining what should be done in the future. The most important task of the accident preventionalist is the education of individuals that they may act safely.

There are several spheres of activity into which the life of the ordinary individual divides itself. These are, briefly, home, industrial, and public. There is undeniably a certain similarity among the various things done by an individual in any one of these spheres of activity, guided to a considerable extent by daily habits.

Paralleling this division of activity it is also true that accidents occur where men live, where they work, and in public places. Accident prevention should accordingly be undertaken with this in mind. Two accidents of the same type may be subject to entirely different preventive methods because one of them occurs in a public place while the other occurs in a home. Similarly, two accidents essentially different in type may become similar from the prevention standpoint because they both occur in a home under domestic conditions.

There is a fourth classification of accidents that is frequently made; namely, the separation of motor vehicle public accidents from those public accidents not involving a motor vehicle.

At the present time, information about accidental deaths, classified as suggested here, is not available. To be specific, some 17,000 persons died in the United States in 1927 as a result of falls. Some of these were falls of construction laborers from buildings, others were of men in factories, still others were of persons on floors and rugs in homes. We do not know the number in each of these groups; and this despite the fact that a reasonably exact distribution of all such accidents into the classes mentioned would be of the greatest value in prevention work.

Not knowing how many persons are killed each year in industries, in homes, and in public places, all we can do at present is to estimate them on the basis of meager information. And if more than one agency attempts to make such an estimate there is liable to be a wide divergence of results. Let me repeat that this information is vitally

important. It would make possible, excluding automobile accidents, a separation of each accident classification in the *International List of Causes of Death* into the three groups of public, home, and industrial accidents.

It would of course be insufficient to have such a separation only for the country as a whole. The differences from one part of the country to another are great and significant. Perhaps the outstanding one is the difference between rural and urban sections. We should want, therefore, a complete separation of the rural and the urban experience, covering type of accident as well as place of accident. At the present time we know much less about rural accidents than about urban accidents, because difficulty has been experienced in the past in obtaining detailed accident information except in cities. It is quite certain, however, that this grouping of accidents by place of occurrence would be quite different in country from in city.

We also need to obtain detailed information covering the age and sex of accident victims in each of these three classifications. These things would be of immense value to the safety worker because accident prevention efforts, to be successful, must be directed at specific hazards in specific locations. By the grouping of accidents in the way suggested, the prevention efforts can be correlated with the natural phases of human activity, with much better results than are otherwise possible.

CIRCUMSTANCES OF ACCIDENTS

The vehicular accident reporting card prepared and issued by the National Safety Council is now widely used. I mention this card because it illustrates the idea of obtaining detailed information on circumstances of accidents. In this case the circumstances relate to motor vehicle accidents only. Answers are required to such questions as: "What was the driver doing at the time of the accident?" and under this question such possibilities are suggested as turning right, turning left, passing standing street car, etc., all designed to throw new light on the circumstances surrounding the accident. Another question is: "What was the pedestrian doing?" Still others ask about the road condition, the light condition, and so on. If the conditions and circumstances revealed in such reports are actually used to educate motor vehicle drivers and pedestrians to avoid taking those actions which result in accidents, then we have taken a step toward the solution of the problem.

Information of this kind is needed regarding all types of accidents. Some of it is now available in connection with industrial accidents. In

a few states some of it may be had relative to motor vehicle accidents. But in both of these cases the information is far from satisfactory as representing nation-wide conditions. For public accidents not involving a motor vehicle, and for home accidents, we have almost no such information.

We need to know not only how many falls occurred in homes, but also how these falls occurred; how many of them were falls on stairs and steps; how many resulted from tripping on rugs; how many from falling off porches and from trees, etc. In the classification of home fires we need to know whether the fire was started by a match, by spontaneous combustion, by poor electrical wiring or by something else. Something can be done toward the prevention of falls by simply pointing out to persons that so many occur in homes; but much more can be done if the circumstances under which those falls occur can be accurately set forth.

The same thing is true of public accidents. We need to know how many accidents occur in falls in public buildings, how many result from flying objects of one kind or another, how many from elevator accidents, etc.

From what sources of information may we expect to obtain these facts? Several possibilities suggest themselves: A state industrial commission may be expected to obtain reports of all accidental deaths falling within the scope of the Workmen's Compensation Law. The usefulness of this information is limited to a considerable extent by lack of uniformity in Workmen's Compensation Laws and lack of uniformity between the various states in statistical procedure.

A state motor vehicle department, with a properly prepared law requiring reports of motor vehicle accidents, may obtain rather complete information on motor vehicle deaths. In some 8 or 10 states this is being done in quite a satisfactory fashion.

The insurance companies are in a position to obtain complete and accurate information on such deaths as occur to their policy holders. The limitation here is the obvious one that not all persons in the country are insured.

A review of these and other sources shows them to be inadequate for our purpose. If a complete record of accidental deaths in any state, community or nation is wanted, we must turn to the officials who receive, by law, reports on all accidental deaths.

To do this job in a complete fashion will require a certain amount of additional procedure on the part of registrars of vital statistics. This is because the death certificate, as at present constituted, will not reveal the information which is outlined as desirable for accident pre-

vention purposes. While this certificate does make possible complete reporting on deaths by disease, the detailed reporting of accidents must be accomplished by some new means.

What has been done in this direction? I shall attempt to tell you very briefly. About one year ago, A. A. Whittemore, M.D., State Health Officer of North Dakota, and an officer of the North Dakota State Safety Council, wrote to me pointing out how meager was the available information on accidents for use by the North Dakota Safety Council in its prevention work in that state. At that time he asked the coöperation of the National Safety Council in proposing some method whereby he, as head of the State Health Department and Registrar of Vital Statistics, could obtain complete and detailed information on at least fatal accidents in his state.

After an exchange of correspondence a proposal for a supplementary accident reporting form was made through my office. Dr. Whittemore, with characteristic energy, printed a quantity of these forms and immediately put them to use in North Dakota, requiring in every case of accidental death a report on this form in addition to the usual death certificate. Shortly after that time, as the news of this pioneering job spread to other states, James E. Bauman, Assistant Director of the Ohio State Health Department, wrote of his interest in doing this same thing for the State of Ohio. The proposed reporting form was brought up to date and was given a trial of several months in that state. Very recently the proposition has also been taken up in the State of Arkansas.

This suggested reporting form is far from perfect. Changes in it will undoubtedly be necessary as a result of experience. It is true, however, that the form is not a radical departure from similar work that is being done. The information requested on motor vehicle accidents, for instance, corresponds exactly with the work being done in the traffic accident field by some 60 cities and 8 or 9 states with compulsory accident reporting laws. The section pertaining to industrial accidents is the same as that recommended by the U. S. Bureau of Labor Statistics. In all other respects the reporting form was designed so that the information obtained would be comparable with any that is being obtained in other ways. A punch card for use in mechanical tabulation has also been developed; and forms are available which facilitate an analysis of the information.

It is my hope that this plan will be tried out by many more states. I am sure that as its use spreads, resulting in much new data, we will see reductions in accidents.

DISCUSSION

E. S. MACPHAIL, FELLOW A. P. H. A.

Superintendent, Census and Vital Statistics Branch, Bureau of Statistics, Ottawa, Can.

THE first purpose of classifying deaths from accidents is the separation of these and of other violent deaths from the deaths which are due to natural causes. The classification of accidental deaths according to the nature of the injury does not in general seem to be of first rate importance. It is of interest to know how many die from fracture of the skull, how many from the piercing of internal organs, how many from broken ribs, etc.; but this classification would take on its main usefulness in connection with a knowledge of the total number of cases, so that a case rate could be reached. Standing alone it does not seem to merit an adoption as the general principle of subdivision. The main object in a classification of accidents is their prevention, and it may be that by not going far in the subdivision of this class, the International List limits its own usefulness.

It has also to be noted, as Mr. Forney states, that the classification is not on a uniform basis. In addition to accidents in mines and quarries, where the type of locality instead of the type of accident is the criterion of classification, there are also such rubrics as "accidental mechanical suffocation," and "accidental drowning," which describe rather the manner than the circumstances of a death. This also applies to "accidental burns and scalds," except that in this case the caution is inserted (except those resulting from conflagration, the latter, number 178, being classified on a different basis). The death is attributed to conflagration whether it is by burning, suffocation, a fall, or by being trampled upon in trying to get out of a building.

To take, for example, drowning, it seems fairly clear that to point a lesson for prevention, further details are required. It should be ascertained whether the victims were swimming at the time of the accident, were in pleasure boats or in larger vessels, or whether these accidents were industrial in their nature, that is, whether those involved were fishermen, sailors, etc. We do not tabulate this kind of information and do not as a rule even possess it. Of 298 cases of deaths from accidental drowning in the Province of Ontario in 1926, 14 were given as industrial in their nature—sailors, fishermen, river drivers and lock masters; 9 were drowned while swimming and 9 in some other stated manner. In no fewer than 253 cases the record failed to give any details beyond the statement that the decedent was drowned.

Mr. Forney's suggested division of accidents into three classes—in industry, at home and in public places, appears to have a great deal of significance. Presumably prevention of accidents in industrial life will be largely attained by inspection of premises and regulation of safety appliances; prevention in public places may be largely a matter of regulation regarding traffic, overhanging signs, etc.; but it may also depend on care exercised by public servants as in the matter of clearing slippery streets, maintaining adequate protection against the danger of falling into excavations, taking proper precautions in the matter of demolition of buildings, etc., etc. On the other hand, the prevention of accidents in the home environment will depend almost wholly upon individual precautions, and the work of the preventionalist must here be confined in the main to education.

If, however, accidental deaths are to be published under these three headings

an exact definition of the field embraced under each will be required. Industrial accidents do not perhaps offer great difficulty in this respect, although there is certainly a difference between work which is well organized and conducted by a body of men under the leadership of an employer or foreman and that which is carried out by an individual on his own behalf. In the latter case, again, prevention will be mainly a matter of individual precaution. As between home and public accidents there appears to be a borderland in which it would be difficult to say under which heading accidents should be classified.

For example, is it to be assumed that all drownings except the industrial occur in public places (except in the very few cases which occur on the home premises), or is the distinction to be drawn between places such as beaches which are under public regulation and protection and those drownings which occur in more private surroundings such as in unsupervised water?

Some cases are rather embarrassing—for instance, should the passengers who are drowned in a shipwreck be classified as having died of drowning or as having died of accidents of transportation? In the matter of elevator accidents, are all of these to be considered as occurring in public places or would an elevator in a rooming house or apartment house be considered as belonging to the home environment. Falls might offer many cases in which it would be hard to decide to which rubric the death appertains, and on the whole it seems that a good deal of definition would be required before accidents could be tabulated under these headings with any probability of fair comparison between the statistics published by different bodies.

It is apparent that the mere division into environments will not accomplish everything from the preventive standpoint. To see what kind of material we had on hand in our office at Ottawa, deaths from certain forms of accidents for the Province of Ontario for the year 1926 were reviewed. Reference has already been made to the deaths from drowning, but it may be interesting to note what the returns on hand show for several other kinds of accidents.

Of 259 deaths due to falls 74 were shown to have taken place in the home environment. The preventionalist who would wish to effect improvement by means of cautionary literature would, however, need to know more than this. Of these falls, 41 were on steps or stairs, 7 from window, balcony, etc., 11 were falls on a floor and 2 off tables, chairs, ladders, etc. The number of falls, industrial in their nature, amounted to 156; falls in public places numbered 19, of which 10 were falls on pavement, street or ice, 1 was from a height while 8 were of some other nature. In no fewer than 110 cases the information was limited to the fact of a "fall," and the accident could not be further classified.

Deaths from accidental traumatism by machines numbered 46. Of these 5 were due to an elevator accident and 3 were industrial. Corn cutters accounted for 3 deaths, circular saws for 5 and threshing machines for 3; in 30 cases there was no detailed information. It may be presumed that in nearly all cases where an elevator is not involved these accidents from machines are industrial.

Deaths classified under 181, accidental absorption of irrespirable or poisonous gas, numbered 28, of which 16 were credited to carbon monoxide. In 4 of the 16 cases the accident was attributed to automobiles, but in the remaining 12 further information was not available; of the remainder, 4 deaths were charged to coal gas and 7 to illuminating gas. The important feature here seems rather the circumstance than the chemical nature of the gas.

Poisoning by food was given as the cause of 20 deaths. In 12 cases ptomain

poisoning was the cause; in 5 cases deaths were attributed to toadstools and poisonous mushrooms. The number of cases is small but the example is cited as one in which from the standpoint of prevention it is necessary to know the kind of food article responsible for the damage.

Under the Canadian system of classification, deaths in which an automobile figured are classified as automobile accidents whether in the case of a pedestrian struck by an automobile or the collision between an automobile and a train or other vehicle. The total number of deaths coming under the classification of automobile accidents in Ontario for the year 1926 was 242. An examination of these certificates revealed the fact that in 82 cases pedestrians had been killed by automobiles, in 15 cases deaths were due to collision between automobiles and trains, in 6 cases between automobiles and street cars, in 9 cases between two automobiles, and in 3 cases between an automobile and some other vehicle. In 15 cases there was no external contributory vehicle, while in 107 cases the details of the accidents were not given. Motorcycles when stated as the cause have been excluded from the above analysis. It is evident that for a more detailed classification of automobile accidents than is now available in Canada we would have to demand such classification on the certificate (a rather difficult matter, when the form of the certificate envisages deaths from natural causes as well as by violence), or to refer the question back to the local registrar in the manner suggested by Mr. Forney, or to obtain this additional detail from coroners' reports, police reports or other sources.

Mr. Forney points out the necessity of classifying returns of fatal accidents into rural and urban, arguing with considerable truth that conditions surrounding these accidents are likely to be very dissimilar. A difficulty arises here, however, in deciding at what point the distinction will be made, whether by the census definition of rural and urban, or whether the minimum for the higher category should be, say cities and towns of 5,000, 10,000, 25,000 or even 100,000 population. We are embarrassed here between the desirability of making all significant distinctions and the impracticability of carrying the division too far.

Another difficulty arises in this matter. For the movement of population in general, the significant locality is no doubt the locality of residence, and it is customary to tabulate deaths in vital statistics either by the place of residence or by the place where the death occurred. From the standpoint of preventive measures, however, the significant locality for deaths from accident is not necessarily either of these but the place where the accident occurred. Quite recently the Dominion Bureau of Statistics had a communication from the chief constable of one of the Canadian cities taking exception to a tabulation of automobile accidents on the grounds that the figures published for his city included a number of cases in which the accident had occurred beyond the city limits but where the victim had been hurriedly rushed to a city hospital in an attempt to save life. The bulletin giving the figures complained of contained a caution on this very subject but the difficulty remains. It may be argued that this is properly a matter for police statistics, and not for vital statistics; nevertheless, if accidents are tabulated with a view to present the information in the best form for preventive purposes, the locality of occurrence takes on especial interest.

Mr. Forney has referred to the classification of industrial accidents and the possibility of obtaining reports on deaths of this nature when they fall within the scope of workmen's compensation laws. In Canada the Federal Labour Department pursues a more ambitious policy and endeavors to collect particulars of fatal (as well as of non-fatal) industrial accidents.

The Labour Department gathers its information from a variety of sources, including press clippings, and attempts even to cover the field of agricultural accidents. It must be admitted, however, that statistics compiled from such heterogeneous sources can be made complete only at the cost of exhaustive labor, and it seems unfortunate that with records presumably covering all except a negligible number of the accidental deaths in the country these records cannot be made available for the purposes of compiling industrial accidents.

If a scheme such as Mr. Forney suggests is followed, difficulties will no doubt arise as to the degree of detail in which statistics of accidental deaths can be collected and published. The form suggested by him is very detailed with regard to vehicular accidents, and at the present day it is very proper that a great deal of attention should be centered on this type of accident. In so far as other accidents are concerned, however, it might be suggested that necessary details are neglected. There is no inquiry designed to show under what circumstance an accident may have occurred; in public accidents the rubric, "buildings and structures," appears somewhat inadequate; street accidents "non vehicular" also appears a somewhat indefinite type; and in home accidents no distinction is made between the kinds of falls.

These things are mentioned, not as criticism, but to illustrate the difficulties which will arise if the vital statistician goes beyond the International List in determining at what point practical considerations must put a stop to further subdivision of classes of accidents.

After the registration of the cause of death in the usual manner it appears probable in accordance with Mr. Forney's suggestion that this second form (one referred to as being used in North Dakota and Ohio to obtain supplementary information) also should be completed by the local registrar as he is in the best position to know whether the information can be obtained from a police report or a coroner's report, or whether he must go to other sources. It will, however, be apparent that this is thrusting additional work on a class of men whose duties as registrars are usually incidental to the tenure of an office of a municipal nature. Whether these additional duties will be welcomed with such zeal as to promise their conscientious performance is a question which may well arise. This is of course a matter not for the federal but for state and provincial offices both in United States and in Canada.

Consultation Center for School Children Suffering from Heart Disease in Berlin, Germany

A MUNICIPAL consultation center for school children with heart disease was recently established in Berlin. At this center, school children are examined before they are allowed to engage in long hikes, swimming or other sports, or gymnastics, and also before they select an occupation.—*Zeitschr. f. Kinderschutz, Familien- und Berufsfürsorge,* Vienna, Sept., 1928, p. 146.

Symposium on Schoolroom Ventilation*

Reports on Schoolroom Ventilation Studies

NEW HAVEN, CONN.

LEONARD GREENBURG, PH. D., FELLOW A. P. H. A.

U. S. Public Health Service, New Haven, Conn.

THE frequency of the common cold among adults throughout this country is so high that one hardly requires a statistical treatment of this subject to become aware of the importance of this problem. Recent studies of the U. S. Public Health Service[1] show that respiratory diseases account for 47 per cent of all the cases of illness reported in a large industrial group during a 5-year period. Among school children the problem is one of greater magnitude, for the child is more susceptible to respiratory diseases than is the adult.

Evidence has been slowly accumulating, which serves to show that the method of ventilating the schoolroom has an important bearing on the health of the school child as measured in terms of respiratory disease rates.

In the first study of this subject made by the New York State Commission on Ventilation the findings appeared to us to be of considerable importance. For this reason the study to be described was inaugurated in the fall of the year 1926.

The present study was conducted in 7 schools of New Haven, Conn., by permission of the superintendent of schools and with the assistance of members of his staff to whom we are indebted.

The desideratum was of course to select schools of both types (mechanically and naturally ventilated), situated geographically as closely as possible together in order to study pupils from homes having the same social and economic backgrounds. In addition, it was essential to obtain the best examples of the types of ventilation under study that the city had to offer. The final selection of the 7 schools, 4 mechanically ventilated and 3 window ventilated, represents the most satisfactory choice from these points of view.

The 4 mechanically ventilated schools are between 14 and 26 years old, the average being 19 years. These schools are all two stories in height, made of brick with cement and wood floors and ventilated by a

* Presented before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

fan located in the warm air chamber. In a few cases accessory direct radiation is provided. The warm air enters the classroom by means of a duct, usually approximately 25 x 30 inches, located near the ceiling, and leaves the room by a 25 x 30 inch register located at the floor level. In the case of one of the mechanically ventilated schools (Worthington-Hooker), heating and ventilation is accomplished by the univent system.

The 3 window ventilated schools are all older than the mechanically ventilated ones. They average 54 years of age, varying from 39 to 65 years. Heating is in each case accomplished by direct radiation in general placed on the outside walls of the rooms but not in accord with the very best practice with respect to the location of windows. The windows are generally provided with slanting window boards. The gravity exhausts from the schoolrooms vary from 12 x 18, to 24 inches square. In most cases these are at the floor level and for this reason do not adequately meet the requirements of this type of system.

ORGANIZATION AND CONDUCT OF STUDY

In all, 3,596 pupils were under observation in this study, 2,052 in the 4 mechanically ventilated schools and 1,546 in the 3 window ventilated buildings. The study was begun in December, 1927, but because of the extended vacation, we have only utilized data from January 3 to April 1, inclusive.

Absences were reported on a form devised for this purpose. All the teachers were required to submit the cause of absence for every child away for one-half day or longer. The teacher in this instance determined the cause of absence from the child, from the parents, and in some cases by notification from the family doctor. In addition to these data concerning all absences, we have been able to obtain a complete set of absolutely independently collected data concerning absences of a duration of three days and more. In this case the diagnosis was made by the doctor or health department nurse. These data were obtained through Dr. C. C. Wilson, a student in the Yale Medical School, who was then engaged in a study of school absences in all the schools of New Haven, Conn. The present study, therefore, makes use of two independently collected sets of data, one of all absences and one of absences of three or more days' duration. Throughout this study we have considered respiratory illnesses to consist of colds, sore throat and other affections of the respiratory tract, such as pneumonia, bronchitis, etc.

By means of a suitable mimeographed record, we collected data from the schools, showing the number of children who while in at-

tendance appeared to be suffering from respiratory disease. The value of these data is in our opinion highly questionable, and for this reason we are not reporting them at this time. Information concerning the temperature of schoolrooms was obtained by observation either by the teacher or one of the pupils of the dry bulb thermometer four times during the course of the school day. These temperatures were recorded on the mimeographed form provided for this purpose.

At the start of the study the teachers were impressed with the importance of learning the true cause of absence and of reporting the true temperature of the schoolroom. At no time were instructions or suggestions issued to the teacher or any other of the operating officials concerning the management of ventilation systems or the proper temperature to be maintained in the schoolrooms. The test was devised as a study of actual operating conditions as found in the ordinary schools of an average American city.

THE RESULTS OF THE STUDY

As pointed out earlier, it is highly important that the two groups of schools be comparable with respect to age group and nationality. The first analysis of our material disclosed the fact that the mechanically ventilated schools had an average percentage of 29.9 pupils of American parentage as contrasted with 15 per cent in the window ventilated group. For this reason we examined our data and eliminated from the mechanically ventilated group the Worthington-Hooker School which possesses a very high population of American parentage (70.8). The elimination of this school with its univent system served also to make the ventilation of the mechanically ventilated group more nearly of uniform character and finally yielded a mechanically ventilated group of schools having an average of 17.5 per cent of pupils of American parentage as contrasted with 15 per cent in the naturally ventilated group. From this viewpoint, the two groups are highly comparable. The age factor is also of much importance and our two groups now possess pupils of highly comparable age, 7.9 in the mechanically ventilated group and 8.6 in the naturally ventilated group of schools.

Examination of these two groups of schools reveals the fact that the number of pupils in each group is approximately the same, 1,573 as compared with 1,546; the total number of pupil sessions is very nearly the same, 180,000 and 187,000; the mean weighted daily temperature is 67.6 in the mechanically ventilated group and 68.1 in the naturally ventilated group of schools. In all of these foregoing respects the two groups of schools are very nearly alike. The data for

absences, however, in these two groups of schools show striking differences. The mechanically ventilated group suffers a total absence rate (all causes) of 6 per cent of the total pupil sessions, whereas the naturally ventilated group has a rate of 3.9. All absences due to respiratory disease amount to 3.0 per cent in the mechanically ventilated group and 1.8 in the naturally ventilated group. For three-day and more absences due to respiratory illnesses, the rate in the mechanically ventilated schools is 3.3 per cent and in the naturally ventilated schools is 1.2 per cent.

The observed differences in these two groups of schools cannot be ascribed to differences in age distribution for, in the same grades (and hence about the same ages), the respiratory disease rate is higher in the mechanically ventilated schools than in the naturally ventilated ones, the actual figures being the following from the 1st grade to the 6th inclusive. For the mechanically ventilated schools 5.0, 3.8, 3.8, 2.8, 2.1, 2.3, 2.0; for the naturally ventilated schools 3.7, 2.0, 1.8, 1.6, 1.9, 0.9, 1.3. In each one of the corresponding grades, the rate in the naturally ventilated schools is lower than that in the mechanically ventilated ones.

In attempting to make certain that the origins of these absences have been truly established, we have analyzed the three-day absences into the following groups: all causes, respiratory illness, other illnesses and other causes. It was found from this analysis that the mechanically ventilated schools showed an excess of 5,000 pupil sessions absence due to all causes, approximately 4,000 of which were due to the excess of respiratory illnesses in the mechanically ventilated group over the naturally ventilated group; approximately 650 pupil sessions were ascribed to other illnesses, and but 350 pupil sessions to other causes. In other words, there was a very slight excess in absences in the mechanically ventilated group due to other causes (an amount equal to but two pupils absent during the course of the entire study), a somewhat greater amount of absences due to other illnesses, but still a comparatively small number, and a real excess of absences (approximately 4,000) due to respiratory illness.

Of the fallacy involved in the use of even weighted average temperatures, we are quite aware. Studies of the distribution of temperature in the schoolrooms failed to yield any information which would tend to indicate that there were significant differences existing between the rooms in this regard, and as pointed out earlier the average weighted temperatures failed to yield any significant differences. No investigations have been conducted of humidity or air motion in any of the schools under study. This remains for the future. It may well

be that the significant differences between the conditions maintained by the two systems of ventilation are linked up possibly with humidity and most likely with air motion.

REFERENCE

1. Sickness among industrial employees. *Pub. Health Rep.*, 41: 113 (Jan. 22), 1926.

CLEVELAND, O.

LYMAN W. CHILDS, M. D.

Supervisor of Health Service, Board of Education, Cleveland, O.

REALIZING that the incidence of respiratory affections among pupils and teachers presents a major problem, we decided to make a study in Cleveland of the effects of the two common types of ventilation—the forced draft system, and the open window type—upon the incidence of respiratory diseases and their sequelae among school children.

The plan previously used by the New York Commission on Ventilation in similar investigations offered a method of study. It was intended that the information secured should supplement the information this body had already accumulated in similar and previous investigations. In order to coöperate more fully with the Commission, their secretary, Thomas J. Duffield, was invited to meet with our committee. He subsequently rendered invaluable aid.

In practically all of the older school buildings in Cleveland, the ventilation is by open window. In the newer buildings situated in the outskirts of the city, the ventilation is by fan. Our first problem was the selection of the school buildings. There was no money available for the modification of the open window rooms. We, therefore, failed to comply with the recommendations of the Commission in the equipment of these rooms with gravity ducts and window deflectors. The buildings included in the study are as follows:

Harvard and Oliver Hazard Perry have split-steam systems with direct radiation and automatic regulation providing six changes of air per hour in accordance with the Ohio State Code, using 2 heat inlets into each room on the corridor side, 8 feet above the floor, 2 exhaust outlets at the floor line on the corridor side. No building has air washers or artificial humiditation. (Harvard has 11,970, and Oliver Hazard Perry 8,920 cubic feet per room, exclusive of cloakrooms.)

Sowinski will be interpreted as having window air supply, gravity vent flue and direct radiators under windows without automatic regu-

lation and without window deflectors in all windows. (Sowinski has a capacity of 11,770 cubic feet per room exclusive of cloakrooms.)

Broadway may be interpreted as having window air supply, but no vent flues with direct radiators under windows, without automatic regulation and without window deflectors. No changes were made in any buildings, nor in the composition of the population of these buildings, to bring the various elements of the experiment under more complete control. (Broadway has a capacity of 11,970 cubic feet per room, exclusive of cloakrooms.)

The schools were well matched for composition of population as to age and grade, social and economic status and national and racial origin.

The regular mental testing program of December, 1927, indicates that the schools which are mechanically ventilated have a somewhat less intelligent population than the schools which were naturally ventilated.

The committee in charge of the study discussed the factor of intelligence and decided to neglect it entirely as of no particular consequence. Since the results are favorable to the more intelligent group as well as to the naturally ventilated schools, it may be well to make note of the fact here.

The study was made in February and March, 1928, using the forms and following in the main "The Methods of Analysis" of Thomas J. Duffield.[1]

The method of determining the incidence of respiratory disease was made uniform throughout by the careful supervision of the Health Service Department of the Board of Education and the coöperation, under the direction of this department, of teachers, supervising nurses, and attendance officers. It was found convenient in the operation of this experiment to consider Sowinski open window building and Oliver Hazard Perry fan building as Group I; Broadway open window and Harvard fan building as Group II.

Two nurses devoted their entire time to instructing the teachers and investigating the cases present with respiratory diseases. The nurses in turn were instructed and supervised by the supervisor of health service. One nurse was assigned to Group I and one to Group II, alternating at the end of each week. Difficulty was experienced by both teachers and nurses in detecting slight colds. They were instructed to report or record no pupils present with a cold who did not have well marked symptoms, such as conjunctivitis, reddened throat, discharging nose, and voice symptoms, possibly coupled with coughing and sneezing. In other words, children with doubtful symptoms were

TABLE I

COMPOSITION OF POPULATION IN SCHOOLS

Nationality	O. H. Perry Number	O. H. Perry Per Cent	Sowinski Number	Sowinski Per Cent	Broadway Number	Broadway Per Cent	Harvard Number	Harvard Per Cent
U. S. White	259	33.5	246	25.9	246	30.1	310	30.7
Russian	17	2.2	41	4.3	24	3.0	12	1.2
Italian	86	11.1	18	1.8	25	3.1	22	2.1
Hungarian	14	1.8	4	0.4	5	0.6	1	0.1
Polish	8	1.0	352	36.9	377	46.3	555	54.9
Czecho-Slovakian			10	1.0	5	0.6	10	1.0
German	30	3.9	46	4.8	20	2.5	32	3.2
Austrian	120	15.5	26	2.7	35	4.3	16	1.6
U. S. Negro	1	0.1	11	1.1	15	1.8	1	0.1
English	25	3.2	12	1.2	9	1.1	6	0.6
Jugo-Slavian	177	22.9	13	1.3	7	0.9	1	0.1
Canadian	6	0.8	9	0.9	1	0.1	1	0.1
Lithuanian	8	1.0	108	11.2	6	0.8	1	0.1
Scandinavian	5	0.7	7	0.7	1	0.1		
Scotch	10	1.3	13	1.3	5	0.6	1	0.1
Irish	4	0.5	9	0.9	3	0.4	2	0.2
Roumanian					1	0.1		
All Others	4	0.5	28	2.9	29	3.6	40	4.0
TOTAL	774		953		814		1011	

TABLE II

	Mechanically Ventilated Schools			Naturally Ventilated Schools		
	Harvard	O. H. Perry	Total	Sowinski	Broadway	Total
A. Total Pupil Sessions	35,984	24,408	60,392	33,365	38,660	72,025
B. Total Absences	2,252	1,283	3,535	1,633	2,071	3,704
Per Cent of Total Pupil Sessions	6.3	5.3	5.9	4.9	5.4	5.1
C. Pupils Absent with Respiratory Disease	777	515	1,292	787	651	1,438
Per Cent of Total Pupil Sessions	2.2	2.1	2.1	2.4	1.7	2.0
Per Cent of Total Absences	34.5	40.1	36.5	48.2	31.4	38.8
D. Total Pupils Present	33,732	23,125	56,857	31,732	36,589	68,321
Per Cent of Total Pupil Sessions	93.7	94.7	94.1	95.1	94.6	94.9
E. Pupils Present with Respiratory Disease	2,964	3,634	6,598	1,789	1,422	3,211
Per Cent of Total Pupil Sessions	8.2	14.9	10.9	5.4	3.7	4.5
Per Cent of Total Pupils Present	8.8	15.7	11.6	5.6	3.9	4.7
F. Pupils Present and Absent with Respiratory Disease	3,741	4,149	7,890	2,576	2,073	4,649
Per Cent of Total Pupil Sessions	10.4	17.0	13.1	7.7	5.4	6.5
G. Mean Temperature (F.°)	69.8°	70.5°	70.1°	69.3°	70.3°	69.8°

not asked to hold up their hands and acknowledge that they did or did not have colds, but regularly filed in front of the teacher, instructed by the nurse, who closely observed the cases.

Doubtful cases were reëxamined by the nurse. Teachers and nurses had one thought in mind, and that was to arrive at an analysis of the truth. Field visitors, middle-aged women from the attendance department, were given the same instructions as the nurses and, in accordance with these instructions, they daily determined and reported the cause of absences when they had visited the homes. They alternated their groups at the end of each two weeks so one visitor would not remain longer than that in one group of schools.

SUMMARY OF DATA

	Natural Ventilation Sowinski and Broadway	Fan Ventilation Harvard and O. H. Perry
1. Period of study	Feb. 6 to Mar. 23, 1928	Feb. 6 to Mar. 23, 1928
2. Pupil sessions, number	72,025	60,392
3. Pupils present and absent with respiratory diseases, expressed in sessions	4,649	7,890
4. Percentage	6.5	13.1

It will be seen that respiratory ailments among pupils present and absent were twice as frequent in the fan ventilated rooms as in the rooms with natural ventilation.

In comparing the two types of ventilation in reference to pupils absent with respiratory diseases, the difference found is insignificant. The same is true for total absences for all causes (see Table II). The 4 schools studied represented highly mixed race stocks, although they were well matched for composition of population (see Table I). In mixed race stocks, absenteeism is likely to be due to causes other than illness. Truancy particularly is likely to be greater.

In the Cleveland schools, a monthly bulletin of school attendance is issued by the superintendent's office. The school with the best daily attendance is first upon the list. Principals in their zeal for a good attendance discourage absenteeism on account of colds, unless they are of a serious nature. Moreover, the practice of absenting children from attendance in schools because of colds varies greatly in different localities. Some of the intelligent parents are in the habit of giving their children bed rest during the first day or two of an attack of acute coryza. Other parents pay no attention whatever to a cold and completely ignore its presence in sending their children to school. On the other hand, children present with a respiratory disease in school can be readily detected by teachers, nurses, and doctors.

The chief of the Bureau of Reference and Research of the Cleveland Public Schools in his statistical treatment of the collected data

endeavored to eliminate the element of chance in comparing the types of ventilation in their influence upon health. This chance element was seized upon by the conservative members of our committee as offering the possible explanation of the results of the experiment. In order to reduce to a minimum this accidental element, differences between schools and groups of schools in illogical combinations and arrangements were tabulated.

As an additional check, each building included in the Cleveland study was pitted against every other building regardless of the type of ventilation. The difference found between Harvard and Oliver Hazard Perry combined (mechanically ventilated) on the one hand, and Sowinski and Broadway combined (naturally ventilated) on the other, was more than twice the difference found between Sowinski and Oliver Hazard Perry combined, and Harvard and Broadway combined. No difference between schools or groups of schools compared accidentally or illogically was so great as the smallest difference between schools logically compared.

In all probability, then, the differences found are not due to mere chance, but represent real differences, reasonably certain to be due to differences in the ventilation of the buildings.

It has been stated that, for the purposes of our experiment, the only rooms available as open window rooms were in schools of an old type. The cubic capacity of these rooms is somewhat greater than that of rooms in modern school buildings. Thus, Broadway's rooms had 11,970 cubic feet capacity each, exclusive of cloakrooms; Sowinski, 11,770; Harvard, 10,690; Oliver Hazard Perry, 8,920. Broadway furnished 298 cubic feet per pupil; Sowinski, 294; Harvard, 267; Oliver Hazard Perry, 223.

The incidence of colds in these rooms proved to be in an inverse ratio to the number of cubic feet per pupil; thus, Oliver Hazard Perry, furnishing the smallest number of cubic feet per pupil, showed 17 per cent of colds; Harvard with 267 cubic feet showed 10.4 per cent; Sowinski with 294 showed 7.7 per cent; Broadway with 299 showed only 5.4 per cent.

The rooms with the greatest air capacity per pupil made the most favorable showing. On the other hand, there was a distinct correlation between the amount of air change and the number of colds. The most modern fan building, Oliver Hazard Perry, with the greatest air changes (6 changes per hour), showed the greatest incidence of respiratory diseases. Harvard, with a less modern ventilation equipment and presumably with an air change of somewhat less than 6 per hour, was next in order of respiratory diseases. Sowinski, a school with in-

sufficient air ducts near the floor, and with considerably less air change, was next in order, while Broadway, with no exhaust ducts, and but a feeble air change, showed the fewest number of colds.

Dry bulb thermometers were used in all schoolrooms under observation. The temperature was taken by monitors (pupils appointed by the teacher for this purpose), whose duty it was to read at intervals the thermometer suspended from the ceiling in the center of each schoolroom to a point just above the heads of the children. These monitors read the temperature at stated intervals and recorded it. When a room in the open window classrooms was found to be overheated, the monitors threw open the windows until the temperature had dropped to normal or below. In the fan ventilated buildings, the custodian was notified concerning an overheated room. In the mechanically ventilated classrooms, the temperatures were fairly steady, while in the open window classrooms the temperatures were variable. This was particularly the case in the Broadway School, which showed the best results and which has been noted for a variable classroom temperature.

It is generally conceded that the humidity of the fan ventilated classrooms was lower than the open window classrooms. This is generally true of all fan ventilated school buildings in the city of Cleveland in which a humidifier has not been installed. The results of the experiment show a greater prevalence of colds in classrooms with the lowest humidity.

REFERENCE

1. Duffield, Thomas J. School Ventilation Studies of the New York Commission on Ventilation. *Am. School Bd. J.*, Jan., 1928, p. 57.

SYRACUSE, N. Y.

THOMAS J. DUFFIELD

Executive Secretary, New York Commission on Ventilation, New York, N. Y.

THE School Ventilation Study in Syracuse was inaugurated during 1926. The first year's work has been described in numerous articles[1,2,3,4] which give information concerning the organization and method of study.

The study during the school year 1927–1928 followed the same general lines as during 1926–1927. There were, however, several differences worth noting. These may be summarized as follows:

1. Twelve schools with 4 different types of ventilation were included in the second study as against 6 schools and 3 types of ventilation in the first.

2. Respiratory illness among the pupils was taken as the criterion in the second study as in the first, but in the latter year the school nurses determined the inci-

dence of such illness among the pupils present, a function performed by the teacher during the earlier study.

3. In addition to the data on absences due to respiratory illness, absenteeism due to other illness was also recorded during the second year.

4. More complete data on air conditions in the classrooms were collected by a trained observer during the second year.

It should be pointed out that none of the schools included in this study complies with the recommendations of the earlier Commission. The new window ventilated schools in Syracuse have central fan exhaust systems which created, in so far as the rate of air change was concerned, conditions approaching those obtained by means of fan supply and exhaust systems.

The types of ventilation which have been under observation may be classified as shown in Table I.

TABLE I

NUMBER AND TYPE OF VENTILATION OF SCHOOLS INCLUDED IN THE SCHOOL VENTILATION STUDY, SYRACUSE, N. Y.

Type of Ventilation		Number of Schools	
Supply	Exhaust	1926–27	1927–28
Fan	Fan	2	4
Fan	Gravity duct	1	3
Window	Fan	0	2
Furnace	Gravity duct	3	3

By an arrangement with the Syracuse Board of Education through the School Health Service, under which the Commission provided supplementary nursing service during the year, it was possible to have the school nurses collaborate more closely with the study than during the previous year. The nurses kept the attendance and health record forms on which they entered for each session for each classroom included in the study:

1. Number of pupils on the active roll
2. Pupils present
3. Pupils absent
4. Pupils present with respiratory illness
5. Pupils absent because of respiratory illness
6. Pupils absent due to other illness

The information concerning the first three of these items was obtained from the teacher. By inspection of the pupils and questioning the teacher, the nurse determined the number of pupils present who in her opinion were affected with cold or sore throat. This provided the data called for in item 4. From physicians' certificates, excuses sent in by parents, and home visits, the nurses determined the number of pupils absent because of respiratory and other illness, required by items 5 and 6.

One of the serious deficiencies of the preliminary study of 1926–1927 was the lack of sufficient data on air conditions in the classrooms.

The teachers had kept a record of the dry bulb temperatures, but there was during the earlier study only a single series of observations of the relative humidity and the temperature distribution in the different classrooms, and there was no record of the rate of air change; nor of the air velocities in the different parts of the room.

During the second year, the teachers recorded the temperatures as during the first year. Through the generosity of the Taylor Instrument Companies, it was possible to install a dry and a wet bulb recording thermometer in one classroom of each school during the second study, and it is expected that these records will be extremely helpful in determining the air conditions prevailing under the different types of ventilation and in the different schools.

In addition to these records, the Commission was fortunate in having the services of an extremely able research engineer, Margaret Ingels, M.E., formerly a member of the staff of the Research Laboratory of the American Society of Heating and Ventilating Engineers, who during routine visits to the classrooms made the following observations:

1. Temperature distribution:
   a. Desk top temperatures at the corners and at the center of the seating section
   b. Floor temperature at the center of the seating section
2. Relative humidity:
   a. Sling psychrometer readings in two corners of the classroom
3. Rate of air change:
   a. Vane anemometer readings at supply and exhaust ducts
4. Air velocities:
   a. Kata thermometer readings at two corners of the seating section

Unfortunately, it has not yet been possible to complete the analysis of the attendance and health records with reference to these various air conditions, and for that reason this report will not deal with this phase of the subject.

The 1926–1927 study having indicated a rather close correlation between the incidence of respiratory illness in the mechanically ventilated schools and precipitation (see references 2, 4 and also "The Weather and the Common Cold," Report to the Committee on Public Health Climatology, Vital Statistics Section, American Public Health Association, 1928 *), the attendance and health records from the 1927–1928 investigation are being studied in the light of outdoor weather conditions as reported from the Syracuse Station of the U. S. Weather Bureau. This also is one of the phases of the analysis of the data that has not been completed at the time of this writing.

* See p. 1, this issue, "The Weather and the Common Cold.

As the analysis of data from the 1927–1928 study in Syracuse has not been completed, it is impossible to render a complete report at this time. There are, however, certain phases of the study that may be commented upon now, with the provision that such comments are tentative and subject to revision.

Table II shows the average number and average age of pupils and their percentage distribution by sex and nationality of parents for each school and type of ventilation included in the study during 1927–1928. The 6 schools included in the study during the first year were: Danforth, Seymour, Salem Hyde, Merrick, Montgomery and Townsend.

TABLE II

AVERAGE NUMBER AND AVERAGE AGE

PERCENTAGE DISTRIBUTION OF PUPILS BY SEX AND NATIONALITY OF PARENTS (ENTIPE YEAR) By School and Type of Ventilation

School Ventilation Study, Syracuse, N. Y., 1927–1928

School	Average No. of Pupils	Average Age of Pupils	Percentage Distribution of Pupils by Sex		Percentage Distribution of Pupils by Nationality of Parents				
			Male	Female	American White	Colored	Jewish	Italian	Other Foreign
Fan-Fan									
Danforth	380	9.5	49.9	50.1	86.6	—	4.7	2.9	5.3
Franklin	213	8.5	50.3	49.7	28.5	—	—	50.3	21.2
Madison	391	9.6	51.8	48.2	55.1	6.9	22.6	3.1	12.3
Seymour	522	10.0	49.3	50.7	64.1	1.0	0.9	18.1	15.9
Total	1506	9.6	50.2	49.6	64.2	2.1	7.4	14.9	13.2
Fan-Gravity									
Lincoln	426	9.2	50.6	49.4	92.9	—	0.7	3.9	2.5
McKinley	409	9.4	50.7	49.3	90.1	—	0.6	9.2	0.1
Salem Hyde	290	9.1	51.8	48.2	89.0	—	—	10.5	0.5
Total	1125	9.2	51.0	49.0	90.9	—	0.5	7.5	1.1
Window-Fan									
Elmwood	382	9.2	50.0	50.0	92.3	—	1.4	2.9	3.4
Wash. Irving	609	9.8	51.5	48.5	34.9	11.9	35.5	3.5	14.2
Total	991	9.6	51.0	49.0	57.0	7.3	22.4	3.2	10.1
Furnace-Gravity									
Merrick	243	8.8	48.7	51.3	92.0	—	2.7	1.0	4.3
Montgomery	310	9.7	49.2	50.8	53.6	3.2	13.2	7.4	22.6
Townsend	212	7.9	55.3	44.7	2.6	—	—	97.4	—
Total	765	8.9	50.7	49.3	51.7	1.3	6.2	30.3	10.5

The crude attendance and health records by type of ventilation but without regard to the racial characteristics of the populations of the various groups are presented in Table III.

TABLE III

CRUDE ATTENDANCE AND HEALTH RECORDS BY TYPE OF VENTILATION

School Ventilation Study, Syracuse, N. Y., 1926–1927 and 1927–1928

School Year	Total Absences	Abs. Due to R. I.	R. I. among Pupils Pres.	Total Incidence R. I.
	Total Attendance and Health Records [1]			
Mechanical Ventilation (Fan-Fan and Fan-Gravity)				
1926–27	7.2	3.0	12.6	15.6
1927–28	7.0	2.2	2.7	4.9
Mean	7.0	2.4	5.4	7.8
Natural Ventilation (Furnace-Gravity)				
1926–27	4.9	1.8	7.0	8.8
1927–28	5.7	2.1	4.2	6.3
Mean	5.4	2.0	5.4	7.4
Window-Fan				
1926–27	—	—	—	—
1927–28	9.0	2.4	2.5	4.9

1. Rate per 100 pupil sessions.

The rates of total respiratory illness given in Table III suggest that, while the naturally ventilated, furnace-gravity schools appeared to be clearly superior to the mechanically ventilated schools during the first year of the study, this does not hold true during the second year.

The rates for the two years show the total incidence of respiratory illness to be 5.4 per cent higher in the mechanically ventilated schools; the rates of respiratory illness among the pupils present are identical in the two types of ventilation, while the rate of absenteeism due to respiratory illness is 20 per cent higher in the mechanically ventilated schools (2.4 per cent vs. 2.0 per cent).

Analysis shows the great fluctuations between the findings in the two years to lie in the rates of respiratory illness among the pupils present in the classroom, although the absenteeism reported due to respiratory illness is 26.7 per cent lower in the mechanically ventilated schools and 16.7 per cent higher in the naturally ventilated schools during the second year.

A test, the details of which need not be examined at this time, showed that the influence of the personal equation of the nurses, who were making the inspections of the pupils present in the classrooms to determine the incidence of respiratory illness, was so great as to invalidate any conclusions based on comparisons of their reported findings. This leaves the absenteeism reported due to respiratory illness as the sole reliable index for judging which of the methods of ventilation is more conducive to the health of the pupils.

From the 1926–1927 study, it appeared that absences from school because of respiratory illness were much more frequent among pupils of American families, whereas the rate of respiratory illness among

pupils present was higher in the schools attended by pupils of foreign parentage. The same finding appears to be true during 1927–1928 as shown in Table IV.

TABLE IV

SUMMARIZED ATTENDANCE AND HEALTH RECORDS [1]

By Race Stock of Pupils

School Ventilation Study, Syracuse, N. Y., 1927–1928

Race Stock of Pupils	Total Absenteeism	Absences Due to Respiratory Illness	Respiratory Illness among Pupils Present	Total Respiratory Illness
Italian	4.0	1.6	10.5	12.1
American	6.7	2.7	1.9	4.6
Numerous	8.6	1.9	2.3	4.2
All Schools	7.2	2.3	2.9	5.2

1. Rate per 100 pupil sessions.

Absenteeism due to respiratory illness is a reliable index only when comparisons are made between schools attended by pupils of approximately the same racial characteristics. In view of the fact that 2 of the 3 mechanically ventilated schools in the Syracuse study during the first year, and 4 out of 7 such schools during the second year were attended by pupils largely of American parentage, whereas only 1 of the 3 furnace-gravity schools is attended by pupils of this group, it would be manifestly unfair to condemn mechanical ventilation simply because the schools with that type of ventilation showed higher rates of absenteeism due to respiratory illness. The data must be examined with reference to both the race stock of the pupils and the type of ventilation. Table V presents the information in this manner.

TABLE V

ABSENTEEISM DUE TO RESPIRATORY ILLNESS [1]

By Race Stock of Pupils and Type of Ventilation

School Ventilation Study, Syracuse, N. Y.

Type of Ventilation	All	Race Stock: Italian	American	Mixed
		1926–27		
Fan-Fan	2.9	—	3.5	2.5
Fan-Gravity	3.4	—	3.4	—
Furnace-Gravity	1.8	1.0	2.4	2.0
All	2.5	1.0	3.2	2.3
		1927–28		
Fan-Fan	1.9	1.9	2.2	1.7
Fan-Gravity	2.7	—	2.7	—
Window-Fan	2.5	—	3.3	2.0
Furnace-Gravity	2.1	1.2	2.5	2.2
All	2.2	1.6	2.7	1.9

1. Rate per 100 pupil sessions.

This table brings out the following interesting facts:

1. The schools attended largely by pupils of Italian parentage made the best showing both years, those with American pupils the worst, while those with pupils of many races occupied the intermediate position. This justifies the separate treatment of these groups.

2. In the various racial groups, the furnace-gravity schools made the best showing during the first year. This is also true of the schools attended largely by pupils of Italian parentage in the second year.

3. In the American group during the second year the school with fan supply and fan exhaust made the best record with the furnace-gravity school next, the schools with fan supply and gravity exhaust third, while the new school with window supply and fan exhaust was highest.

4. In the schools attended by pupils of numerous races, the fan-fan school had the best record during the second year, the furnace-gravity school the worst, while the window-fan occupied the middle position.

In contrast to the apparently clear-cut superiority of the furnace-gravity schools during the first year's study, the findings of the second year are contradictory and confused. This finding would seem to indicate that, in so far as the incidence of respiratory illness is concerned, more evidence is necessary before it is possible to say that one of the types of ventilation under investigation is superior to another.

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DISCUSSION

PROFESSOR C.-E. A. WINSLOW, of Yale University, presented for consideration the following summary of the results obtained in 8 studies in 6 different cities:

ABSENCES DUE TO RESPIRATORY ILLNESS
Per 1,000 Pupil Sessions

Place	Year	Fan Supply	Unit Ventilation	Furnace	Window-Fan	Window-Gravity
New York	1915–16	14				10
New York	1916–17	13				11
New Haven	1926–27	30	32			18
Cleveland	1927–28	21				20
Syracuse	1926–27	30				
Syracuse	1927–28	22		18	24	
Chicago, W	1927–28	39		21		24
Chicago, N	1927–28	41		40		18

RESPIRATORY ILLNESS IN ATTENDANCE

Per 1,000 Pupil Sessions

Place	Year	Fan Supply	Unit Ventilation	Furnace	Window-Fan	Window-Gravity
New York	1915–16	76				22
New York	1916–17	98				44
New Haven	1926–27	22	61			31
Cleveland	1927–28	109				45
Syracuse	1926–27	126		70		
Syracuse	1927–28	27		42	25	

Despite the many inaccuracies involved in respiratory disease records, Professor Winslow believed that the picture presented by the table is a striking and convincing one. Absences due to respiratory illness show, in every one of the 6 instances, an excess in fan ventilated rooms, as compared with rooms ventilated by the window-gravity method, and in 3 cases out of 4 this is also true of respiratory illness in attendance. This latter factor is a highly inaccurate one, subject to great variation according to the personal equation of the teacher or the nurse who makes the observations. On the whole, however, the conclusion can hardly be resisted that respiratory disease in window-gravity ventilated rooms is only two-thirds as great as in fan ventilated rooms. Unit ventilation, furnace heating, and window supply with fan exhaust, closely resemble fan supply in their results.

The theoretical explanation of these facts is however exceedingly difficult. The New York Commission on Ventilation originally believed that fan rooms were prejudicial on account of overheating, but in New Haven and Chicago the fan rooms were cooler than the window rooms, and yet showed a very marked excess of respiratory disease. Nor can differences in relative humidity be invoked to explain the observed phenomenon. There remain, as the two most probable hypotheses, the effects of local drafts, or some as yet mysterious influence upon the electrical condition of the atmosphere incident to passing over highly heated surfaces.

Meanwhile, Professor Winslow pointed out that, even though we do not understand the fundamental physiological processes involved, we have apparently ample ground for preferring window ventilation, with an air change of some 10 cubic feet per minute, to fan ventilation with a larger flow of warmer air. There is no other means, hygienic or bacteriological, by which it is possible to reduce by one-third the incidence of infections of the upper respiratory tract, yet this remarkable result can apparently be accomplished by the substitution of one type of schoolroom ventilation for another.

Chlorination as a Factor of Safety in Shellfish Production*

WILLIAM FIRTH WELLS, FELLOW A. P. H. A.

Biological Engineer, North Atlantic Oyster Farms, Inc., West Sayville, N. Y.

FROM the Atlantic Seaboard of the United States come four-fifths of the world's production of oysters. Wholesale condemnation of these growing areas should become a public health measure of the last resort, after all the possibilities of conservation by public health engineering methods have been exhausted. Elimination of pollution is the ideal solution, but as in the protection of public drinking water supplies, prevention has not kept pace with increased pollution, and as by analogy we find in fact many valuable areas which can be conserved only through safety factors applied to the product.

Extensive studies of shellfish conducted over a long period of years have discovered biological and sanitary principles which enable us to control, under artificial conditions, the functions essential to their self purification. The transitory contamination for which oysters have been held responsible is not a true infection of the oyster but a bacterial accumulation in the healthy act of feeding.

Without attempting to describe the intricate mechanism of an oyster's gill, whereby in the combined process of breathing and feeding it filters daily many gallons of water to derive therefrom the minute drifting microscopic life and matter which constitutes its food, it is sufficient to a working understanding of the operation to state that the entire inner surface exposed to any contamination from the water is coated with a continuously moving mucus layer which carries along the agglutinated particles by ciliary action. This layer, constantly renewed by the secretion of sterile mucus from within, resembles in action a belt conveyor. Originating in the gill or incurrent water chamber, it travels crosswise to the current from which the food is strained, slowly forward through the funnel-shaped mouth, enters the sack-like stomach cavity, passes through the short gut reaching the cloacal or gill effluent chamber, and is ejected some five hours after entering the shells.

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* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

Bacterial contamination reaching the tissue surfaces through the feeding function is therefore by that same function progressing toward elimination. The significant fact in considering means for improving the sanitary quality of shellfish lies in the rapidity with which such matters are removed. Within a few hours the normal transit has been accomplished, and the bulk of accumulated material has been discharged in concrete masses from the animal. There remains but the problems of permitting or stimulating the natural bacterial elimination, while at the same time safeguarding the shellfish from recontamination.

It was further discovered that shellfish close tightly in the presence of considerable excess of free chlorine, thus protecting the interior tissues from its effects, but permitting the sterilization of everything exterior to the shells, and secondly, that the chlorine soon becomes neutralized, permitting the shellfish in pure salt water to eliminate rapidly by their natural functions all interior contaminating materials accumulated on the tissue surfaces.

Numerous experiments involving these principles, conducted since 1914, not only in this country but in England and France, have demonstrated the rapid reduction in bacterial contamination. A commercial plant for the cleansing of mussels has been in successful operation in England since 1916, and in New York State seven plants either for purifying oysters, or safeguarding the product during the conditioning operation have been constructed since 1922, treating some 250,000 bushels a year. As a result of promising studies by the Massachusetts State Department of Health, a plant for purifying soft clams is being installed, and suggestive results are reported in Rhode Island on the treatment of hard clams.

The action of New York State against the conditioning of oysters for the market in waters exposed to more or less direct local contamination, unless such waters are treated to a degree satisfactory to the Commissioner of Health, brought into prominence another aspect of the process. It has been the practice of several growers to store oysters in floats for a period sufficient to permit them to eliminate the food materials accumulated within their digestive tracts and on other tissue surfaces. Such a conditioning operation appears to enable long shipments in better condition and at the same time bring them clean to the table; and the use of chlorinated water prevents danger of recontamination after harvesting.

If the operation is carried out in accordance with the purification principles outlined, it not only secures the prevention of recontamination but to a high degree removes possible contamination from han-

dling. It constitutes therefore a factor of safety added to all oysters. Increasing experience continues to add new evidence that the greater danger does not lie in the growing area. Where the primary object is not to purify oysters from uncertified beds, but to eliminate chance contamination in the processes of preparation for the market, there is a striking analogy to the pasteurization of milk which may be sterile at the source but subject to contamination before it reaches the consumer.

The largest plant is capable of treating over 1,000 bushels of oysters a day in twelve shallow basins. Each basin is 11 by 22 feet and 2 feet deep. The oysters are supported by wooden racks which can be lifted to permit cleaning of the deposits which accumulate beneath. The salt water is pumped directly from the bay through a 200-foot suction line, and after chlorination is delivered 150 feet further into the basins. A hose stream of 150 gallons a minute permits the flushing of loose dirt from the oysters before closing the basins. Raised beveled edges insure drainage away from the basins, and the continual flushing of the concrete walks with chlorine water reduces to a minimum any chance of recontamination. This is further insured by maintaining an excess of chlorine in the basins in which oysters are being handled and throughout the working day changes of water containing several parts per million are frequently made. After the men have left the plant in the evening the water is drawn and refilling goes on with just sufficient chlorine to insure sterilization of the water without interfering with the functioning of the oysters. Before the men come on in the morning the basins are again emptied and refilled with stronger chlorine dosage again.

This plant has kept a bacteriological record of operation, and we are enabled to present the following statement of a year's results through the courtesy of the Bluepoints Company, Inc. Table I is a summary of a whole season's scores, classed according to the period of treatment, and shows the number and percentage of samples giving scores above 50, 5 and 0.5. There is a distinct decline in the percent-

TABLE I

RELATION BETWEEN SCORE AND TIME TREATED

Sept., 1926 to May, 1927

Hours Treated	No. Samples	Per Cent Scores Above 0.5	5	50
0	68	89.7	63.3	42.7
0 to 6	123	76.5	44.7	17.9
6 to 12	97	69.1	29.9	6.2
12 to 24	96	59.4	17.7	2.1
24 to 120	96	56.2	19.8	1.0

age of samples exceeding these scores as the period of treatment increases up to 24 hours. Beyond this period the change is not so pronounced, which suggests that a still slight recontamination tends on the average to maintain the score in the vicinity of this minimum value. While definite conclusions can be drawn from this table of percentages, a clearer index of bacterial reduction can be derived from a study of the distributions of samples by the statistical method applied in Figure I, where these values have been plotted on the basis of normal probability. The test of fitness to such treatment is given by the degree to which three points of each series fall on a straight line, which would be the case with perfect chance variation. It may be seen that by this test the closeness is quite sufficient to draw the conclusions which follow.

It is obvious that, in any case of chance distribution of bacteriological results, considerable variation exists, and isolated values both higher and lower are obtained from a product whether good or bad. The proportion of samples, however, which give a high or low value furnishes a measure of quality, and we have chosen the median as that

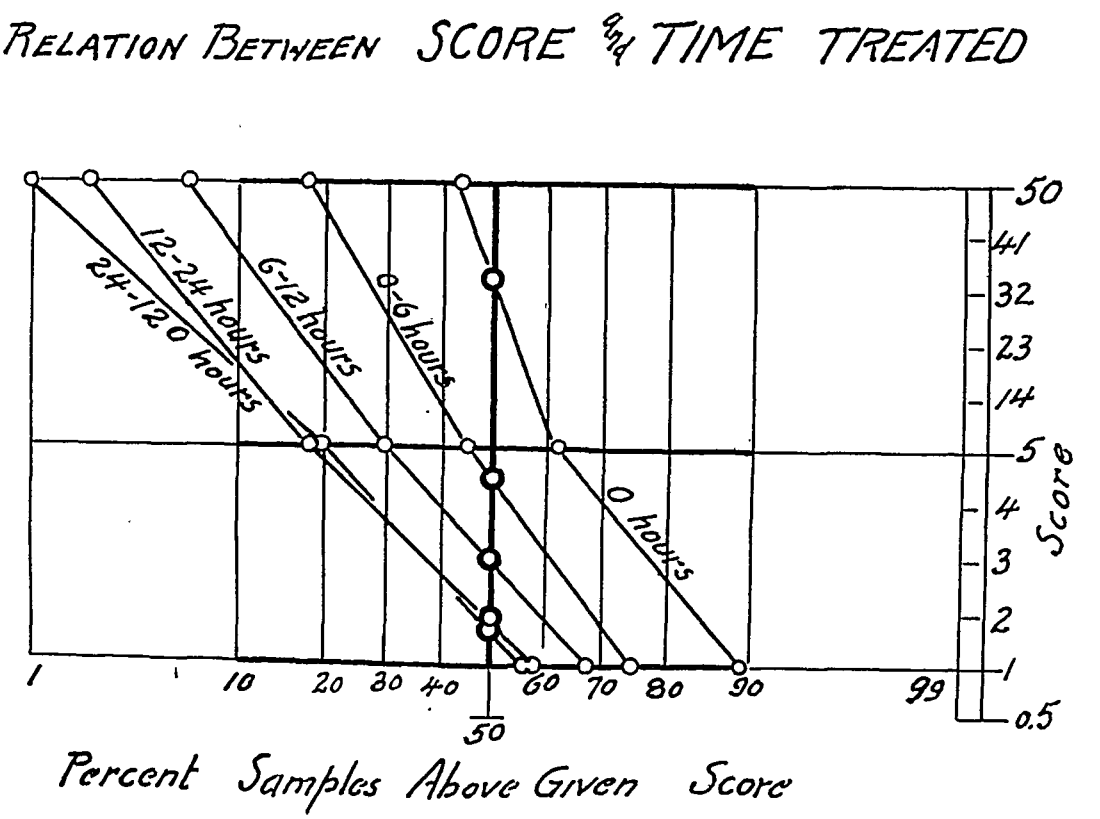


FIGURE I

Graphical determination of median score, from distribution of determined percentages of samples of oysters above given scores, plotted on Hazen's logarithmic probability paper.

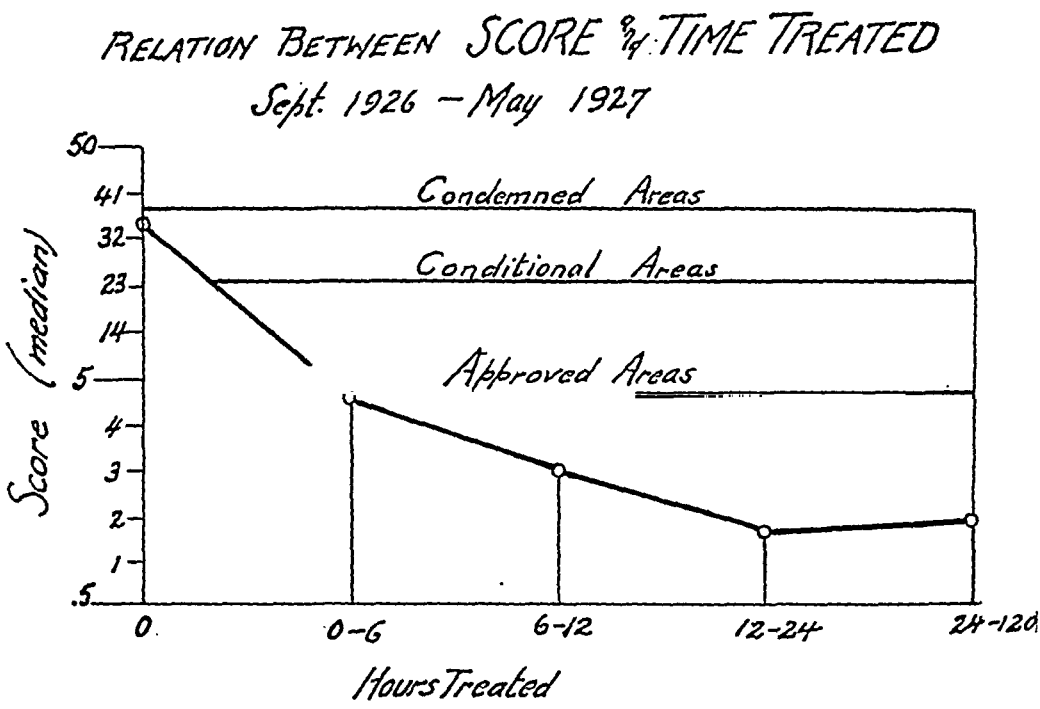


FIGURE II

Comparison of median annual scores of oysters, treated different periods in chlorinated sea-water, with median scores of oysters from classified grounds.

proportion which gives the most stable and accurate index of each series. In other words, we aim to discover that score which half the results would pass, and half would not. Incidentally the steepness of line indicates the degree to which the results vary from this value, and it may be observed that the initial results from a steeper line, which gets progressively flatter as the purification continues. This means that the treated oysters give a more consistent and uniform product than that started with, which should be credited as an advantage of the process beyond the mere lowering of the median score itself. Each heavy circle then includes a point representing the median score for each series. These have been transferred to Figure 11, which illustrates graphically the improvement in the oysters as they pass through the basins. The overall reduction in this score for the season after 24 hours' treatment is approximately 93 per cent.

TABLE II

SCORES FROM CLASSIFIED GROUNDS NARRAGANSETT BAY

(Averages of group percentages for 0–5–10–15° C.)

Area Class	No. Samples	Per Cent Scores Above 5	50
Approved	577	43.2	13.6
Conditioned	888	67.5	27.7
Condemned	638	83.7	35.5

The results of this practical performance may be interpreted by comparison with those from grounds classified according to the sanitary survey. The data collected by the State of Rhode Island during the years 1910–1915 give on Table II the values for three classes of grounds. They show on Figure II the striking similarity between the results from approved ground with those obtained by commercial treatment of oysters with results approaching those from grounds that have been condemned. From conditional grounds a wide margin of safety is provided. This margin will expand with the increased efficiency, through improved equipment and careful operation, represented by experimental results.

With liberal allowance therefore for all the actual and imaginary limitations which have been argued against purification processes, these results conclusively demonstrate the dependability of chlorination as a factor of safety, and show a wide and real margin of safety for oysters from conditional areas treated by the method as judged by its past commercial performance, and promise an increased margin of safety through improvements which inevitably result from continued practical operation. The sanitary quality of the resulting product under these conditions should represent a degree of safety equal and even exceeding that relied upon in oysters from approved grounds. Similar conclusions are reached by epidemiological evidence, which in America has so far failed to detect danger from the growing beds. The pollution load as so determined would, even with a Scotch verdict, be outweighed by any measurable reduction of infection risk, which need not exceed the status of a factor of safety.

CONCLUSION

The annual results of a large commercial plant show, without anticipation of improvement in efficiency indicated by experiments now in progress, that the method of treating oysters in chlorinated sea water is sufficiently well established at the present time to warrant a definite statement of its underlying principles, its achievement in practical operation, the field of its usefulness to the shellfish industry and the security it offers to public health.

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DISCUSSION

GEORGE W. FULLER, FELLOW A. P. H. A.
New York, N. Y.

MR. WELLS' paper is a conservative and lucid expression of the present status of the shellfish industry in relation to its public health aspects. With the exception of milk none of our raw food supplies has been subject to the same degree of hazard between point of origin and the consumer as has shellfish. It is inevitable therefore that with so important a food supply, methods should be found to eliminate to a large extent the hazards and to create a feeling of greater confidence on the part of the consuming public than has previously existed.

It is creditable to the shellfish industry that it has had the vision to tackle its problems on a scientific basis and that it has also had the courage to put into practice a unique sterilizing method based both on the efficacy of chlorine and the physiology of the shellfish.

So far as has yet been brought out the chlorination treatment has reasonably met expectations and improved the score without impairing in any way the market value and edibility of the product. It is to be assumed that better results will be obtained as experience becomes available from plants now in operation or under construction.

A more or less general adoption of the chlorination method involves two main considerations, as has been indicated by Mr. Wells. First, is the improvement of the score and the establishing of a substantial safety factor for shellfish now taken from approved areas beyond polluting influences. The advantage of the highest feasible safety factor will be readily conceded by both the producer and the consumer.

The second consideration involves the proposal to make use of areas ecologically suitable for shellfish culture but subject to a degree of pollution which would make their use questionable in the absence of some such sterilizing treatment as has been proposed for overcoming pollutional hazards. It is quite logical to assume that present growing areas will be extended in this manner as confidence becomes established in the sterilizing method. Steps in this direction must be made cautiously however, because the safeguards depend not only upon soundness of the method but upon the kind of plant equipment employed and the adequate character and performance of the operating personnel.

The first water filtration plants and first milk pasteurization plants did not closely approach in reliability of performance the later ones, nor were the operators of these plants so well trained and equipped as those who came after them.

A factor of no little consequence to the shellfish industry is the development of public opinion so that sewage and other wastes of seashore and related communities will be taken care of satisfactorily. The restriction of the present shellfish areas is due largely to inadequacy of municipal sanitation. Such a situation is susceptible of correction if public opinion can be brought suitably to its support. Improved methods of safeguarding shellfish are no more excuse for slackening sewage treatment than is the construction of a modern filtration plant an excuse for substantial pollution of the raw water supply. Neither does pasteurization give a license to insanitary handling of milk.

The standing of chlorination as applied to shellfish depends largely upon the results obtained with the method in the hands of various workers and the relation of such results to conditions where there is substantial pollution.

FRED O. TONNEY, M. D., FELLOW A. P. H. A.

Department of Health, Chicago, Ill.

THE possible usefulness of the standard method of scoring oysters for *B. coli*, especially in so far as it may be applied to the control of the market product, is materially curtailed by the time required to obtain a final confirmed score on a given sample. A new method has been recently tried out in our laboratory, by which fuller information on the coli aerogenes content of oysters may be obtained in a shorter time.

Mr. Noble of our research staff has been experimenting with the application to oyster scoring of a new cyanide citrate pour plate method originally designed for water analysis.

The most interesting and striking feature of the findings by the new procedure is the indication that the *B. coli* score of oysters, as they reach our market, is principally a *B. aerogenes* score rather than a *B. coli* score. The significance of this finding at present is, of course, debatable, yet I must confess that it gave us a sense of relief to know that the high scores we have encountered were not usually due to the definite fecal type of organism.

R. E. NOBLE

Department of Health, Chicago, Ill.

AT this time we are prepared to state only approximate but interesting figures. We have found that in at least 90 per cent of positive samples the aerogenes types predominated. In these samples the ratio of aerogenes to coli colonies was usually very high and coli types were generally absent. Plate scores of total coli-aerogenes organisms, determined in a manner corresponding to the standard score, usually equalled or exceeded the latter. Plate counts may be less, equal to or greater than the standard score for a given volume of sample which, we believe, is explainable in terms of dilution. For example: a plate count from a 1 c.c. inoculation may show a count of 60 while the 0.1 c.c. and 0.01 c.c. portions in fermentation tubes are positive. Tentatively the conclusion is suggested that this plate method is suitable for oyster analysis and may be used with considerable saving of time in arriving at a confirmed *B. coli* score.

EDITORIAL SECTION

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CAN PREVENTION GO TOO FAR?

CONTAGIOUS diseases can be prevented in two ways—complete isolation, which was attempted by our forefathers with greater success than is possible at present; and immunization, which may be acquired by what we call natural methods or by vaccination. The great success of vaccination against smallpox, and the methods introduced by Wright, have led to the tremendous use of artificial immunization by means of attenuated or killed bacteria or their products.

One may well ask if we have not gone too far in some respects, and if we have not made a mistake in trying to do away with nature's methods of producing immunity. As regards passive immunity, this question is of especial importance, since it is of short duration, and it is well known that when a contagious disease invades virgin territory, it rages with unusual violence. Where an active immunity can be produced by a vaccine, which is comparable to that following an attack of the disease under what may be called natural conditions, the work of man is all to the good.

Even in measles, which is generally regarded as 100 per cent infective, several observers have shown that in epidemics in regions where the disease is seen year after year, the history of previous attacks does not account for all who escape infection. The same statement may be made in regard to influenza, which is also highly contagious. The apparent immunity of those who escape such infections is explained on the ground that repeated small doses of the causative germ, not enough to produce symptoms recognizable either by the patient or by the physician, have produced a strong and lasting immunity. In certain other diseases which are not so highly infectious, such as diphtheria, infantile paralysis and meningitis, the same thing has been observed and fairly well proved.

It is well recognized that the germs of the acute diseases which we most dread are taken in through the upper respiratory tract and given out through the same channels. The droplet infection of Flügge has come to be recognized as of prime importance. Experiments have taught us how far germs can be carried by sneezing and coughing, and the conditions which influence the time they may remain suspended in the atmosphere.

Those responsible for the health in schools have especial reason to consider this mode of infection. In a somewhat loose method, it has been held that the ordinary contact during class periods of one hour is not sufficient time for infection to take place, though occasionally we have had cause to doubt the correctness of this claim. Observations in schools having both resident and day pupils have shown that during outbreaks of diphtheria and scarlet fever the residents were largely infected, while the day pupils remained completely free. The only discernible difference between the two was that the former slept together in dormitories, while the latter slept in separate homes.

Such facts have led Dudley to conclude that under ordinary conditions contact in classrooms for one and one-half hours, as well as the shorter periods on the playgrounds, were not sufficient to produce symptomatic infection. He has also observed that on naval vessels where overcrowding is present, but where ventilation is good, there is a remarkable freedom from contact infections. In the Navy, however, the men have gone through a period of training on shore which has resulted in a certain number of cases of disease and the apparent immunization of the majority.

In certain diseases the droplets are expelled to greater distances than others, owing to the explosive character of their projection. In meningitis, for example, separating the beds by 2½ to 3 feet has been shown to be sufficient to prevent infection; while in such diseases as common colds, influenza and diphtheria, the distance should be considerably greater—the further apart, the better. The separation in linear distance between the faces of individuals is of much more importance than the number of cubic feet of air space per person.

These and other considerations along the same lines have led certain epidemiologists, especially Dudley, to the conclusion that it is inadvisable to reduce too far droplet infection and the immunization produced by it. "Preventive Medicine deals with the herd, not with the individual." Recognizing the apparent cold-bloodedness of the view that individuals must suffer for the benefit of the many, Dudley makes the plain statement that in his own work he would be loath to do away with droplet infection from the naval training establishments

where young boys are converted into seasoned men by adaptation to the bacterial environment with which they must come into contact in their calling. The same reasoning may be applied, to a certain extent at least, to schools.

Many of the ideas expressed are not new, but Surgeon-Commander Dudley[1] has assembled them, with a number of corroborative facts, in a dissertation marked by originality as well as careful reasoning. Doubtless some will consider his ideas revolutionary, but we can commend them to the thoughtful consideration of all who are interested in this most important problem.

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THE CALMETTE–GUÉRIN VACCINE

ATTEMPTS at vaccination against tuberculosis are not new, but all of them up to the present have been failures, though in laboratories certain experiments have had definitely successful results, among which we may mention those in this country by Pearson and Gilliland, at the University of Pennsylvania. In practice, however, we know of no method, either in animals or in man, which has been generally successful, though the laboratory work referred to has been sufficient to keep us hoping and to make us believe that someone will solve the problem in the not far distant future.

For a number of years we have followed eagerly the experiments of Calmette and Guérin, who succeeded in reducing the virulence of a mammalian tubercle bacillus through more than 20 years of cultivation upon a medium containing bile. After 4 years of such cultivation, it had lost its virulence for cattle, and after 13 for all experimental animals, though inoculated animals would react to the tuberculin test, and the germ itself would produce tuberculin. The ability and scientific honesty of Calmette, with his persistence and experience, have given unusual interest to his reports, the most recent and extensive of which are found in his book,[1] published in 1927, and in the current volume of the *Annals of the Pasteur Institute*.[2]

As far as the vaccination of animals goes, we have two recent and authoritative reports. The first[3] gives a series of experiments with guinea pigs. When the infecting dose was reduced to its lowest effective limit, the vaccinated animals were shown to live longer than the unvaccinated, and 6 of the vaccinated, when killed 20 weeks after the death of the last unvaccinated animal, were found to be free from tuberculosis. The authors feel justified in believing that guinea pigs may be completely protected against minimum doses of virulent

tubercle bacilli by means of BCG. Experiments upon guinea pigs, rabbits and young calves at the Research Laboratories of the Department of Agriculture of Canada[4] do not give such favorable results. In a pathogenicity test of BCG made on 134 guinea pigs, 92 were without a trace of tuberculosis when killed, while 30 showed infection, which in some cases appeared active and in others arrested or undergoing resorption. In the early experiments, 6 died of tuberculosis. The authors concluded that the vaccine could not be considered free of pathogenic power, and further showed that the virulence could be exalted by serial passage through guinea pigs; results which are in serious disagreement are those reported by Calmette, Guérin and others. The same workers found that young calves which after vaccination were exposed to natural infection by living with tuberculin reacting cows showed no greater resistance than the controls.

The authors consider that vaccination with BCG is still in the experimental stage, and that the claims made for its harmlessness are open to question.

In 1927, Calmette made an important modification in his vaccination of calves; namely, isolating them from possible infection for 30 days after vaccination, which indicates that his former procedure had not been entirely satisfactory.

These experiments have a direct bearing on the use of BCG for the protection of children. Calmette and his coworkers report on 3,808 children[2] and compare the deaths among these—3.1 per cent—with the general rate of mortality for the first year of life in France for 1922, which was 8.5 per cent. This report has been severely criticised. One is almost forced to believe that the favorable reports of the authors show an undue degree of optimism.

The most that we feel justified in saying is that the whole matter is in the experimental stage, but is in the hands of competent and experienced observers. It may be true, as some claim, that the use of BCG carries danger of infection to the child. Especially in view of the dissociation into two types, one virulent for guinea pigs and the other not, demonstrated by Petroff,[5] we are obliged to hold that the safety of the procedure has not been proved, and for the present must recommend caution in the use of the vaccine while hoping for the best.

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5. Petroff, S. A., and Branch, Arnold. Bacillus Calmette-Guérin (B. C. G.). *A. J. P. H.*, XVIII, 7: 843 (July), 1928.

A REPORT WITH REAL MEAT

THE recently issued report of the Malaria Commission,[1] Health Section, League of Nations, is notable not only for the sound advice on its special problem, but also for the clear enunciation of fundamental principles applicable to all types of public health work. The commission considers it inadvisable to utilize "all available methods of control in the same locality at the same time," preferring to employ first those methods which can be raised above the standard called "minimum effective degree of perfection," this depending upon the means available. Each locality should be studied and methods of control adapted to the region put in force, since measures which are successful in one area may fail in others, owing to different conditions.

Malariologists have widely divergent views which are vigorously defended. Each proposed method varies according to its necessities, efficacy and cost, these in turn depending upon social and economic conditions. These differences of opinion exist in spite of the fact that the basic principles of malarial control are well understood and have been proved efficient in practice. Malaria flees before scientific agriculture. "Integral bonification," a term obtained from Italy, meaning the complete reclamation of land for agricultural purposes by any method or any combination of methods, requires a long time for accomplishment. While this is the ultimate object of antimalarial work, the commission recognizes that the first step must be early diagnosis and treatment of infected persons.

Among other fundamentals, the report points out that each case requires observation and analysis of the factors involved, but "The principal factor in the success of any method is the energy of the hygienist employing it."

Hygiene has often suffered from an excess of zeal on the part of its friends combined with a deficiency of knowledge; for instance, the wholesale slaughtering of cattle on the tuberculin test, the latter often carried out under conditions which precluded the possibility of reliable results. Vaccination against smallpox has suffered at the hands of its over enthusiastic advocates who did not know, or neglected to recognize, the fact that the duration of immunity is variable, so that vaccination with re-vaccination must be taught as well as practiced. Examples might be multiplied, but these will suffice.

Every popular movement attracts undesirable elements to its support, some carried away by an excess of zeal, but some who wish to ride on the crest of the wave for financial or other reasons. In perhaps no other profession is the old saying concerning a little learning being a dangerous thing more true than in public health. Signs are

not lacking of a reaction against the fallacious teaching and practices of underinformed enthusiasts. A letter on "Debunking Health Education"[2] illustrates this. So-called health education, as well as practices founded on "bunk," leads inevitably to the discredit of the efforts of those who are sincere as well as trained, the foundation of cults, and the putting on the market of various foods and preparations for which miraculous claims are made. The list of food fads alone would fill pages. We need only mention the war against white bread, raisins for iron, the alleged effects of constipation or of eating hot food in causing cancer, and so on *ad nauseam*.

As long as the world goes round, a regular crop of fakirs and "suckers" will be produced, each to supply the demand for the other. Well may we pray: "O Lord, make all the bad men fools," since fools seldom attract a large following. Unfortunately most "fakirs" are smart, and know how to play upon human nature. It takes the philosophy of an Oliver Wendell Holmes or a William Osler to accept conditions with equanimity.

We dislike the rôle of preacher, but it seems clear that we must continue our efforts for higher standards of education. For those desiring to engage in public health work or public health teaching, a minimum standard of education should be required, and also a license similar to that required for physicians or lawyers. There is no more reason why the degree of Doctor of Public Health should be sufficient to turn a person loose on the public than there is for the degree of Doctor of Medicine to give the right to practice. All physicians must be licensed after having obtained their degrees, irrespective of the standing of the school from which they graduate. This view is perhaps Utopian, but our aim must be high, even though for a time we may fail in accomplishment.

REFERENCES

1. *Pub. Health Rep.*, Nov. 9, 1928, p. 2957.
2. *J. A. M. A.*, Oct. 6, 1928, p. 1055.

THE GOVERNMENT AND THE PUBLIC HEALTH

THE Executive Council of the American Medical Editors' Association has adopted a resolution declaring the sentiment of the association to be that there should be a medical officer in the Cabinet of the President of the United States. The work of such an officer would be to "look after the interests of the medical profession, and to represent the public health of the nation."

We believe that the medical profession is a unit, in the opinion that there should be a department headed by a cabinet officer for the pur-

pose of directing the welfare of the nation in regard to public health. History is full of instances showing that good health is the greatest single asset which any nation can possess, and this has been recognized by statesmen for many years. All of us are familiar with the statement of Disraeli, "The Public Health is the foundation on which reposes the happiness of the people and the power of a country. The care of the Public Health is the first duty of a statesman," and endorse it. Gladstone said: "In the health of the people lies the strength of the nation."

Nations which are at war recognize the practical bearing of such statements. The commanding general of an army demands that the sick report be made early each day, as he is compelled to know what effective force he can count upon. Strangely enough, there is no such report in times of peace, and we can only guess at the number of disabled and dependent persons in our nation. The most severe charge that can be made concerning this is the well known fact that a large percentage of the disablement is due to preventable and remediable conditions. This was clearly shown in the draft examination during the World War. England and Canada acted on what they learned during that period, and now have cabinet ministers in charge of national health.

If any business were conducted as inefficiently, in regard to bookkeeping as well as practice, as its health matters are conducted by our country, it would go to the wall in a short time. If anything good can be said about war, it is that it has brought to the attention of the nation a condition of affairs which calls loudly for remedy. That conditions are not worse than they actually are is due to the numerous volunteer health organizations which have done, and are doing, such splendid work in various specialties, and which are arousing public opinion. We must also pay our sincerest tribute to the U. S. Public Health Service; but our national organization is such that it is hampered in functioning within the states.

Under the fear of an epidemic of yellow fever, we once undertook the experiment of a National Board of Health, but it was continued only 4 years, though some of its functions were then delegated to the U. S. Public Health Service.

The resolution of the American Medical Editors' Association seems to us to fall short of meeting the necessities of the case, though it is a step in the right direction. We have all watched the movement for the reorganization of the governmental departments in Washington, and are still hoping to see this come to full fruition. In any reorganization which is finally achieved, the health of the nation must take a prominent place.

Our Association has for 3 years endorsed the Parker Bill, which we believe comes much nearer to what is wanted by the people of the country, and what is needed, than merely having a medical officer in the Cabinet. It was passed by the Seventieth Congress, but vetoed by the President. At our recent meeting in Chicago a resolution was adopted urging Congress to pass the Bill over the veto.* It behooves all members of our Association to bear this in mind when Congress convenes, and to use all possible influence on their Representatives.

The great French philosopher Descartes said: "If ever the human race is raised to its highest practicable level, intellectually, morally and physically, the science of medicine will perform the service."

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* *A. J. P. H.*, 18, 11: 1399 (Nov.), 1928.

CONSTITUTION AND BY-LAWS, AND CONSTITUTION FOR SECTIONS, AMERICAN PUBLIC HEALTH ASSOCIATION

As Amended by the Governing Council at the Fifty-seventh Annual Meeting, Chicago, Ill., October 15–19, 1928

CONSTITUTION

ARTICLE I NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

ARTICLE II OBJECT

The object of this Association is to protect and promote public and personal health.

ARTICLE III GOVERNING COUNCIL

A. *Composition:* There shall be a Governing Council consisting of:

1. The officers of the Association.

2. Thirty members of the Council, to be elected by and from the Fellowship of the Association, for three-year terms, one-third retiring each year. These members of the Council shall be nominated and elected as provided for in the By-laws.

If one of these members is elected a Section Chairman, Vice-Chairman, or Secretary, or appointed the representative of an Affiliated Society, a new Councilor to fill such vacancy shall be elected by the Governing Council.

3. The Chairman, Vice-Chairman and Secretary of each Section.

4. A representative to be appointed by each affiliated society to serve for one year. Such representative shall be at the time of his appointment a Fellow of the American Public Health Association.

5. The elective members of the Council of the Health Officers Section.

B. *Terms:* Terms of Councilors shall begin at the end of the annual meeting when elected, and shall terminate at the end of the annual meeting at expiration of term; provided that Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

C. *Reëlection:* After two consecutive terms, an elective Councilor shall be ineligible for reëlection to the Council during one Association year.

D. *The Officers* of the Association shall be the officers of the Council.

E. *Functions:* The functions of the Council shall be:

1. To establish policies for the Association and for the guidance of the Executive Board and the officers.

2. To establish Sections of the Association, to combine or discontinue them when necessary, to maintain coördination among them, and to formulate general rules governing the policies of the Sections.

3. To submit to the vote of the Association all resolutions which have received the approval of the Governing Council.

4. To elect Affiliated Societies, Fellows and Honorary Fellows as provided in the By-laws.

5. To elect the Executive Board and the officers of the Association.

6. To receive from the President, on behalf of the Executive Board, a report of the meetings, policies and work of the Executive Board; a report from the Executive Secretary concerning the administrative work of the year; and a report from the Treasurer concerning the finances of the Association.

F. *A Quorum* of the Council shall consist of ten Councilors.

G. *Meetings* of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to meeting, issued at least twenty days in advance, shall state the purpose of the meeting.

ARTICLE IV OFFICERS

The officers of this Association shall be a President, three Vice-Presidents, an Executive Secretary, and a Treasurer. The officers, with the exception of the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. Officers shall serve from the close of the annual meeting when elected, until the close of the next annual meeting, and until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Executive Secretary shall be elected by and serve at the pleasure of the Executive Board.

ARTICLE V AMENDMENTS

This Constitution may be amended by a two-thirds vote of the Members of the Association present and voting at an annual meeting, provided that the specific amendment to be acted upon is published in the official publication of the Association not less than thirty days prior to the meeting, and provided further that the amendment has received the approval of the Governing Council.

BY-LAWS

ARTICLE I MEMBERSHIP AND DUES

A. There shall be a standing Committee of the Governing Council on Eligibility, consisting of one Fellow from each established Section to be appointed by the President, with terms of three years each, as equal a number as possible expiring each year, the terms of those first appointed to be determined by lot conducted by the Executive Board; this committee to perform such duties as may be specified herein, and such other duties as may be assigned to it from time to time by the Governing Council.

B. There shall be eight classes of constituents who may be elected from the United States, Canada, Mexico, Cuba, and such other countries as may be admitted to representation in the Association. This provision shall not apply to Honorary Fellows or Associate Members. The respective appellations, qualifications for election, and dues shall be as follows:

1. *Fellows:* Only professional health workers, who have been Members of the Association for at least two years, and of established professional standing (whether employed by public or private agencies or in independent private practice), shall be eligible for election as Fellows, provided that a Member shall be not less than thirty years old at the time the application for Fellowship is made, and provided, further, that the following persons shall be considered to have an established standing in the profession of public health, namely:

a. A person who has attained the degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, or other equivalent degree, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has attained an academic or professional degree involving training in public health, and who has been regularly engaged in public health work for four years, having rendered meritorious service in the public health profession, either as a health officer or in responsible charge of work in a state or municipal department of health or other official public health organization.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing equivalent to that required for Fellows under paragraphs "a" and "b."

d. A person regularly engaged in public health work for at least five years, who has given evidence of special proficiency in the service of an official or unofficial public health organization, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

e. A teacher of public health or one of its constituent sciences. As such he shall have attained distinction as an expounder of the principles of public health or its constituent sciences and he shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch of public health service, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

The application for Fellowship shall be made on an approved form and shall be sponsored by two Fellows of the Association who shall be Fellows of the Section with which affiliation is desired, provided, however, that when affiliation with a Section is not desired, the sponsors may be any two Fellows in good standing in the Association. Fellows without Section affiliation shall be known as unaffiliated Fellows.

When the application has been duly sponsored and otherwise completed, it shall be transmitted to the Executive Secretary of the Association, who will make note thereon of such knowledge as he may have concerning the standing of the applicant in the Association. The application shall be forwarded by the Executive Secretary to the Secretary of the Section in which affiliation is desired, for the approval of the Section Council, and when acted upon by the Section Council, it shall be returned to the Executive Secretary by the Secretary of the Section, after he has made endorsement on the application of the action of the Section Council. When the application is for unaffiliated Fellowship, the Executive Board of the Association shall act in place of the Section Council. When the application has been approved by a majority of the Sec-

tion Council or the Executive Board, as above provided, it shall be voted upon by the Governing Council, provided the name of the applicant shall have been officially published at least fifteen days in advance, and provided further that the application shall have been approved by the Committee on Eligibility.

A Fellow may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Fellows may become affiliated with a Section if approved by vote of a majority of the Council of the Section in which affiliation is desired.

The right to hold office or to serve as chairman of a committee in the Association shall be limited to the Fellows of the Association, whether Section Fellows or unaffiliated Fellows. The right to hold office or to serve as chairman of a committee in a Section shall, however, be limited to the respective Fellows in such Sections.

The dues of Fellows shall be $10.00 per year.

2. *Honorary Fellows:* Honorary Fellows may be elected by the Governing Council for distinguished service in public health. Honorary Fellowship shall not include voting power or payment of dues.

3. *Members:* Persons professionally engaged in public health work shall be eligible for election as active Members when sponsored by two Fellows of the Association. They may serve on committees, except as chairmen. Dues $5.00 per year. A Member may belong to only one Section but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Members may become affiliated with a Section if approved by vote of a majority of the Council of the Section in which affiliation is desired.

4. *Associate Members:* Persons interested in public health shall be eligible as Associate Members. They may serve on committees, except as chairmen. Dues $5.00 per year.

5. *Sustaining Members:* Individuals or corporations interested in public health may be elected to Sustaining Membership. Dues $50.00 or more per year.

6. *Affiliated Societies:* A state or provincial public health association or similar regional society including more or less than a state, primarily composed of professional public health workers and organized for the same general objects as the American Public Health Association, may be elected as an Affiliated Society, provided that not less than twenty of its active members and at least one-half of its active members are Members or Fellows of the American Public Health Association. Not more than one such society shall be admitted from the same area.

A society applying for affiliation shall submit a copy of its constitution and by-laws, its last annual budget, a roster of its members and such other evidences of its qualifications as it may desire to submit.

The Committee on Eligibility shall consider all applications for affiliation and report its recommendations to the Governing Council.

The annual dues of Affiliated Societies shall be one per cent of their gross annual income, the minimum dues per society being $10.00 per year.

Each Fellow, Member, Associate Member, and Affiliated Member of the American Public Health Association shall be a member of the Affiliated Society to which he is eligible and, after January 1, 1927, no person eligible for election to an Affiliated Society shall be admitted to Membership, Associate Membership or Affiliated Membership in the American Public Health Association unless such person has qualified or at the same time qualifies as a member of an Affiliated Society.

For every Fellow, Member, Associate Member or Affiliated Member paying annual dues to the American Public Health Association, the American Public Health Association shall remit to the Affiliated Society of which such person is a member the sum of $1.00 per annum.

7. *Affiliated Members:* This class of membership shall include all active (namely professional) members of Affiliated Societies, and in areas where no Affiliated Societies exist such other professional sanitarians as may be elected to this grade. Dues $1.00 per year.

8. *Life Members:* Upon the recommendation of the Committee on Eligibility any individual member of the Association may be elected a member for life. Election to this grade shall not affect the privileges held by such individual in his previous grade of membership. The dues for Life Members shall be $100.00, payable within one year after election, and this payment by such member shall exempt him from any further dues.

C. *Election:* The election of Fellows (see A1 above), Honorary Fellows and Affiliated Societies shall be by the Governing Council.

The election of Members, Associate Members, Life Members, and Sustaining Members shall be by a committee appointed by the Executive Board.

Three-fourths of the votes cast shall be requisite for election.

Upon the recommendation of the Committee on Eligibility the Governing Council may discontinue the Membership, Fellowship or

affiliation of any constituent. Three-fourths of the votes cast shall be necessary for such action.

D. *Dues:* Dues are payable annually in advance. All constituents paying dues shall be entitled to receive the AMERICAN JOURNAL OF PUBLIC HEALTH and, or, such other publications as may be designated by the Executive Board, which shall determine the proportion of dues to be devoted to this purpose.

Constituents of any class whose dues are unpaid for six months or more shall be considered not in good standing. Constituents not in good standing shall not be entitled to vote, hold office or enjoy other privileges or powers of membership. Good standing may be resumed upon the payment of all arrears and dues in advance for one year, provided, however, the lapsed period is not greater than one year. The Executive Secretary shall notify by registered mail all constituents who have been in arrears for a period of eleven months. The names of constituents in any class whose dues remain unpaid for one year or more shall be presented to the Executive Board which shall order the names of such constituents stricken from the Membership roll, provided, however, such constituents have been duly notified as hereinbefore provided in this paragraph. Constituents whose names have been stricken from the rolls in this manner may be again admitted in the manner provided for the election of new constituents in the class for which they make application provided such person or organization complies with the eligibility requirements at the time the new application is made.

ARTICLE II GOVERNING COUNCIL

At least four months before the Annual Meeting the President with the approval of the Executive Board shall name a Nominating Committee of not less than three Fellows, no two of whom shall be from the same Section of the Association or the same state. This committee shall present to the Executive Secretary at least two months before the next Annual Meeting the names of at least twenty and not more than thirty Fellows of the Association selected with due regard to geographical and Membership considerations as nominees for the Governing Council. The Executive Secretary shall publish this list to the Membership. Upon the petition of twenty-five Fellows the Nominating Committee shall add the name of any Fellow to this list provided such petition is received fifteen days before the Annual Meeting. The time for closing the polls shall be determined each year by the Executive Board. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting shall be declared elected. Should two or more candidates receive the same number of votes the Executive Board shall, when necessary, determine by written ballot the order of precedence.

ARTICLE III EXECUTIVE BOARD

A. *Composition:* There shall be an Executive Board of ten members elected by the Governing Council, six of whom shall be members of the Governing Council, and four of whom shall be the President, the retiring President, the Treasurer, and the Chairman of the Finance Committee.

B. *The Terms* of the President, the retiring President, the Treasurer, and the Chairman of the Finance Committee as Executive Board members shall be one year each, and the terms of the other members shall be two years each, expiring in rotation, three each year. These terms shall begin at the end of the annual meeting at which elected, and shall continue until the end of the annual meeting at expiration of term, provided that newly elected members of the Board shall have the right to attend meetings as soon as elected, and shall have no vote until installed.

C. *Reëlection:* After two consecutive terms a member of the Executive Board shall be ineligible for reëlection during one Association year. This provision shall not apply to an officer of the Association.

D. *The Officers* of the Association shall be the officers of the Executive Board.

E. *Duties:* The duties of the Executive Board shall be:

1. To direct the administrative work of the Association.

2. To act as trustee of its properties.

3. To procure funds and to authorize budgets for the Association work.

4. In general to carry out the policies of the Governing Council between meetings of the latter.

F. *A Quorum* of the Executive Board shall consist of four members.

ARTICLE IV OFFICERS

The officers elected by the Governing Council shall be nominated from the floor.

ARTICLE V MEETINGS OF THE ASSOCIATION

There shall be at least one annual meeting of the Association, held at a place to be selected by the Governing Council. Special meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association.

There shall be a Central Program Committee composed of the Secretaries of the

several Sections of the Association and the President and Executive Secretary of the Association. The scientific program of meetings of the Association shall be prepared under the direction of the Central Program Committee.

ARTICLE VI SECTIONS

Sections shall elect their own officers. They shall conduct sessions in coöperation with and under the supervision of the Executive Board. The Constitution and By-laws of Sections and amendments thereto shall be submitted for the approval of the Governing Council, and shall be valid only after such approval.

ARTICLE VII PUBLICATIONS

All publications of the Association and of its Sections shall be issued under the direction of the Executive Board. The Executive Board shall appoint a Managing Editor of the official journal, who may also be the Executive Secretary of the Association. The Executive Secretary shall, with the approval of the Executive Board, appoint an Editorial Board of not less than five members, to serve at the pleasure of the Executive Board. All papers and reports for the annual meetings are to be accepted with the understanding that they shall be the property of the Association for publication, unless this right is waived by the Managing Editor.

ARTICLE VIII STANDARDS

There shall be a Council on Standards which shall be designated by the Executive Board. Any resolution, report or publication which undertakes to establish in the name of the Association or any of its Sections professional or technical standards, shall be submitted to the Council on Standards. The Council shall give notice by publication to the Membership of all proposed standards and report its approval or disapproval of such proposed standards to the Governing Council.

Proposed standards approved by a three-fourths vote of the Governing Councilors voting shall become official standards of the American Public Health Association.

ARTICLE IX FINANCES

The Executive Secretary shall receive and deposit to the account of the Treasurer all remittances sent to the Association. The Treasurer shall be custodian of investments of the Association and shall disburse funds in accordance with duly authorized vouchers. With the approval of the Executive Board he may establish a drawing account for the Executive Secretary. The Executive Secretary shall send each month to members of the Executive Board a financial summary of receipts and disbursements. Once each month, or oftener if called for, he shall also forward to the Treasurer and President an itemized statement of all expenditures. The Executive Secretary and the Treasurer shall be bonded at the expense of the Association in an amount to be determined by the Executive Board. The books of the Association shall be audited annually by certified public accountants, to be appointed by the Executive Board.

ARTICLE X COMMITTEES

Committees of the Association shall be authorized by the Governing Council or the Executive Board. The President shall appoint the members of such committees. Such appointments expire at the next annual meeting, unless otherwise specified.

ARTICLE XI AMENDMENTS

These By-laws may be amended by a majority vote of the total membership of the Governing Council during the annual meeting, provided that twenty-four hours prior written notice thereof has been given. The By-laws may further be amended by a two-thirds vote of those voting at any meeting of the Governing Council called for the purpose, provided that notice thereof shall have been given at least fifteen days prior to such meeting.

CONSTITUTION FOR SECTIONS

ARTICLE I NAME

The name of this body shall be the ..... Section of the American Public Health Association.

ARTICLE II SCOPE OR OBJECT

(To be stated briefly for each Section.)

ARTICLE III MEMBERSHIP

A. *Voting Power:* The right to hold office or to serve as the chairman of a committee shall be limited to Fellows of this Section who have been elected under the By-laws of the Association.

Members may participate in the scientific sessions of any Section and may affiliate with any one Section. They may serve on committees except as chairmen.

B. *Payment of Dues* in the Association is a prerequisite to Section Fellowship, and non-payment of dues shall invalidate Section Fellowship and Membership.

ARTICLE IV SECTION OFFICERS

A. *The Officers* of this Section shall be a

Chairman, a Vice-Chairman, and a Secretary. These three officers shall be the representatives of the Section to the Governing Council of the Association.

B. *Terms:* New terms begin and old terms expire at the end of annual meetings. After four consecutive years in any elective Section office, except that of Secretary, a member shall be ineligible to reëlection to that office during one Association year.

C. *The Chairman* shall preside at meetings of the Section and of the Section Council, and shall be Chairman of the Committee on Program, and of the Committee to advise on Publication of Papers in the AMERICAN JOURNAL OF PUBLIC HEALTH.

D. *The Vice-Chairman* shall preside at meetings of the Section and of the Council in the absence of the Chairman, and he shall be a member of the Section Council.

E. *The Secretary* of the Section shall keep the minutes, and other records of the Section and of the Section Council; and shall transmit to the Executive Secretary of the Association a copy of the minutes of both business and scientific sessions as soon as practicable thereafter. When unable to be present at meetings, he shall thoroughly instruct a substitute as far in advance of the meeting as possible.

The Secretary of the Section shall be ex-officio a member of all Section committees.

The Section Nominating Committee shall renominate capable Section Secretaries whenever practicable, in the interest of continuity in Section work and policies.

ARTICLE V NOMINATION AND ELECTION

A. *Nominating Committee:* The Section Chairman, with the advice of the Executive Committee of the Section, shall appoint a Committee on Nominations at least fifteen days before each annual meeting. The Section Secretary shall be a member of such Committee.

The Committee on Nominations shall present, not later than the second meeting of the Section, at each annual meeting of the Association a list of nominees for the Section offices, and for membership in the Section Council; provided that if the name of any Fellow be transmitted to the Section Secretary over the signature of ten Fellows of the Section at least fifteen days in advance of an annual meeting, the Nominating Committee shall add the name of such Fellows to its own list of nominees. No nominations shall be made from the floor of the meeting. Election shall be by the Fellows of the Section.

Should the Section Chairman fail to appoint a Committee on Nomination as above provided, such a committee shall be appointed for the Section by the President of the Association.

ARTICLE VI SECTION COUNCIL

A. *Composition:* There shall be a Section Council composed of the three officers and from three to six elective members, who shall be Fellows of the Section.

B. *The Terms* of elective Councilors shall be two years each and shall expire in rotation. Terms of Councilors shall begin immediately after the annual meeting when elected; provided that Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

C. *Duties:* The duties of the Section Council shall be:

1. To act in the capacity of a board of directors for the Section.

2. To supplement the Section in authorizing the appointment of committees by the Section Chairman, and to advise in the selection of personnel.

3. To act as a Committee on Resolutions for the Section.

4. To nominate Fellows for election under the By-laws of the Association.

5. To inform the Editor of the official Journal which papers and reports presented at Section meetings merit publication.

D. *Executive Committees:* Between annual meetings, the Section officers shall act as an Executive Committee of the Section Council.

E. *Meetings:* At least one meeting of the Council must be held at the annual meeting of the Section. Interim meetings may also be called by the Section Chairman.

F. *Attendance:* Absence from two consecutive annual meetings, or failure to answer two consecutive official communications on Section business requiring reply, shall be equivalent to resignation from the Council, subject to reinstatement by the Council if good cause is furnished.

ARTICLE VII SECTION COMMITTEES

A. *Authorization:* Committees of the Section may be authorized by the Section or by the Section Council.

B. *Appointment:* Appointment of committee personnel shall, unless otherwise specified, be by the Section Chairman with the advice of the Section Council.

C. *Reports:* All scientific reports, upon presentation to the Section, shall be referred by the Chairman to the Section Council, or to a special reference committee which shall report back to the Section. The Section shall then vote on each report whether or not to adopt. In case of failure of the Section to

take definite action before the end of the annual meeting, such duty shall devolve upon the Section Council.

ARTICLE VIII PROGRAMS

A. The programs of the Sections shall be prepared by the Section Secretary in accordance with the Constitution and By-laws of the Association and the rules and standards established by the Central Program Committee.

B. *All Section Papers* and reports shall automatically become the property of the Association for publication purposes, except as this right is waived by the Managing Editor.

ARTICLE IX AMENDMENTS

Amendments to this Constitution may be made only by the Governing Council of the Association, and in the same manner as the By-laws of the Association; provided that the Section may adopt By-laws not in conflict with this Constitution.

ASSOCIATION NEWS

A. P. H. A. REPRESENTATION INVITED TO PACIFIC SCIENCE CONGRESS

The A. P. H. A. has been asked to send delegates to the Fourth Pacific Science Congress at Batavia and Bandoeng, Java, May 16–25, 1929. This congress will be held under the auspices of the Netherlands Indies Pacific Research Committee, supported by the patronage of the Netherlands Indies Government.

The executive committee of the Fourth Congress has planned the organization of the Congress by four divisions including: Physical Sciences, Biological Sciences and Agricultural Sciences.

DR. GEIGER RAILROAD CONSULTANT

J. C. Geiger, M.D., associate professor of epidemiology, University of California Medical School, San Francisco, Calif., has been appointed through the university as epidemiologist and consultant in public health and hygiene for the Southern Pacific Railroad System. Dr. Geiger has recently made an investigation of tularemia along the railroad's lines in Nevada. He is a Fellow of the A. P. H. A. and is a member of the section council of the Food, Drugs and Nutrition Section of the Association.

DR. CLARENCE O. SAPPINGTON GOES WITH NATIONAL SAFETY COUNCIL

Clarence O. Sappington, M.D., a member of the A. P. H. A. and a frequent contributor to the AMERICAN JOURNAL OF PUBLIC HEALTH AND THE NATION'S HEALTH, has been appointed the first director of the newly created division of industrial health of the National Safety Council, Chicago, Ill.

MR. SHERE GOES TO COMMERCIAL FIRM

Lewis Shere, a member of the Public Health Engineering Section, and a frequent contributor to the JOURNAL, has been granted a year's leave of absence from the Chicago Health Department, where he has been director of the City Division of Dairy Products, to become Director of Research and Publicity of the Diversey Manufacturing Company, Chicago, Ill.

DR. PATTERSON ON STAFF OF JOHN HANCOCK LIFE INSURANCE COMPANY

Raymond S. Patterson, Ph.D., Fellow of the A. P. H. A., formerly with the New Jersey State Department of Health, has been appointed director of health education of the Life Conservation Service of the John Hancock Mutual

Life Insurance Company, Boston, Mass. Dr. Patterson is editor of the Selected Public Health Bibliography published monthly in the *American Journal of Public Health and The Nation's Health,* and has been active in the Public Health Education Section of the Association.

DR. DAVIS WITH ROSENWALD FUND

Michael M. Davis, Ph.D., a Fellow of the A. P. H. A., and chairman of the sub-committee on Organized Care of the Sick of the Committee on Administrative Practice of the Association, has been appointed to the executive staff of the Julius Rosenwald Fund as director for Medical Services. Although Dr. Davis will be permanently located in Chicago, he will continue his close cooperation with the Committee on Administrative Practice. Dr. Davis will direct the program which the Julius Rosenwald Fund is planning to undertake in improving the organized facilities for medical service to the average man of moderate means.

NEW MEMBERS

Alice C. Bagley, R.N., San Francisco, Calif., Assistant Superintendent of Nursing, Metropolitan Life Insurance Company

Charles W. Bergquist, Chicago, Ill., President Chicago Tuberculosis Institute

Shaoch'ing Hsipo Ch'uan, M.D., Tientsin, China, Health Commissioner (Assoc.)

Bertha C. Clow, M.S., Madison, Wis., Instructor and Research Worker in Home Economics Department, University of Wisconsin

Winifred Colvin, R.N., Chicago, Ill., Public Health Nursing

Mary T. Dowling, R.N., New York, N. Y., Industrial Nurse with Press Publishing Company

Neil S. Dungay, Ph.D., M.D., Northfield, Minn., Professor of Hygiene and Public Health and Director of Health Service, Carleton College

George Hay, M.D., Johnstown, Pa., Former Health Officer and City Physician

Jacob J. Hood, M.D., Cicero, Ill., Health Commissioner

Letta Jones, R.N., Chicago, Ill., Public Health Nursing

Henry F. Juengst, C.E., St. Joseph, Mo., Bacteriologist and Civil Engineer, St. Joseph Water Company

Stuart K. Knox, Montclair, N. J., Consulting Hydraulic and Sanitary Engineer

Carl J. Lauter, Washington, D. C., Chief Chemist, Washington, D. C., Water Supply

Charles H. Mayo, M.D., D.P.H., Rochester, Minn., Health Officer

Marion McKinney, B.A., M.S., White Plains, N. Y., Statistician, Health Department

Esther H. Oyhus, Chicago, Ill., Teacher of Oral Hygiene in Public Schools

Ivan C. Peterson, Chicago, Ill., Municipal Engineer

Margaret Reid, B.S., R.N., Indianapolis, Ind., Nursing Field Representative, National American Red Cross of Washington, D. C.

Alphonse M. Schwitalla, A.M., Ph.D., St. Louis, Mo., Dean, School of Medicine, St. Louis University

Roy Schneiter, M.S., Rouses Point, N. Y., Junior Bacteriologist, Food, Drug and Insecticide Adm., U. S. Department of Agriculture

T. B. Sims, Cleburne, Tex., Superintendent Water and Sewer System

Charles F. Tambling, M.A., Mt. Pleasant, Mich., with Department of Anatomy, Physiology and Physical Education, Central State Teachers College

Frank R. Theroux, M.C.E., Chicago, Ill., Sanitary Engineer

George H. Wandel, D.D.S., Riverside, Ill., Supervisor Bureau of Dental Health Education, American Dental Association

Marion Yang, M.D., Peiping, China, Instructor in Hygiene and Public Health, Peking Union Medical College, Chief, Division of Medical Service, First Special Health Area (Assoc.)

P. J. Alwin Zeller, College Station, Tex., Sewage Research, Texas Engineering Experiment Station

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Microbic Dissemination in Schools—After many years of experience the general consensus of opinion is that the isolation of infectious disease has in itself been of no material effect in reducing the morbidity as a whole, irrespective of any influence on age distribution or severity of infection.

The carrier and the individual with sub-clinical infection aggravate the situation. It has been found that in the London County Council Schools 2 per cent of the pupils are diphtheria carriers. It is estimated that the average carrier state remains for about 3 weeks. Therefore the number of carriers in the population as a whole changes 17 times during the year, and with a 2 per cent infection rate there would be 34 per cent of the population infected as carriers during the year. On the other hand, it was found that only 1 per cent of the population was infected with clinical diphtheria and therefore the carriers were over 30 times as numerous as cases in the London County Council Schools.

At the present time little impression can be made on the incidence of the minor droplet infections by attempts to isolate the distributors of them or increase the immunity of their receivers by means of a vaccine. A certain minimum number of bacteria are necessary in order to break down the natural immune defenses of man or animal. The time necessary to contract infection is the minimal infective dose divided by the difference between the rates at which infective material is received and destroyed. This differential rate may be called the velocity of infection.

At the Greenwich Hospital School there were no cases of diphtheria and scarlet fever among the day boys, while 300 infections occurred among the residents. This may be attributed to the more intimate and more extended personal contact in the dormitories.

Atmospheres which support droplets containing specific pathogenic bacteria act as vaccines and increase the resistance to disease of those who breathe them. The occasional immunity to measles among those giving no history of the disease may be explained on the theory that group or herd immunity to the minor respiratory diseases is increased through previous bacterial experience.

Among the pupils of the average London day school during the first 10 years of life, 40 per cent of the susceptibles will acquire immunity by autovaccination while 10 per cent will have succumbed to clinical diphtheria. In the residential or boarding school, such as the Greenwich Hospital School, double the number will have become immune within 3 years by autovaccination, but at a cost of 1 clinical case for every 3 immunized. This means of securing immunity may be compared to active immunization which within 6 months will protect approximately 90 per cent of the susceptible group.

As a means of curtailing the spread of communicable diseases by droplet infection more space should be given to individuals who sleep in dormitories and there should be an increased allotment of linear area available in schoolrooms. The small boy, being more susceptible and having received to a less degree the advantages of autovaccination, requires more space than the large boy. Efficient ventilation decreases the possibil-

ity of infection since a good flush of fresh air acts in two ways: first, it sweeps out the infected droplets, and, second, it prevents the humidity of the air from being raised by the water continually added to it from the lungs and skins of the occupants of the room. Mechanical ventilation has done much to prevent the spread of respiratory infection in the crowded sleeping quarters which, by force of circumstances, must be used on board ship. The danger to the group or herd exists, however, when one interferes with the process of nature which has resulted in the gradual autovaccination of large numbers with the resulting group immunity.—Sheldon F. Dudley, Microbic Dissemination in Schools, *Lancet*, 17: 849 (Oct. 27), 1928.

Diphtheria Prevention in Detroit—Prior to November 1, 1928, there occurred 1485 cases of diphtheria and 179 deaths in Detroit. Of these 179 deaths, 161, or 90 per cent, occurred among children under 10 years of age. Although the number of cases is not unusual, the number of deaths is particularly high. Furthermore all of these deaths are preventable and therefore the Health Department has renewed its campaign to secure the immunization of small children against diphtheria with toxin-antitoxin. Only toxin-antitoxin in goat serum is being used this year. This is to avoid sensitization to horse serum.

Prior to the current year 61,000 Detroit children between the ages of 6 months and 5 years had been protected against diphtheria. This represents 49 per cent of this age group. There remain 64,000 to be immunized. In addition to this 65 per cent of the primary school population has previously been immunized.

In previous years the Health Department has maintained infant welfare, school and special clinics at which immunization could be secured without charge. Various means have been used to advertise the clinics, including paid newspaper advertisements, press stories, posters, bill-board advertising, moving pictures, lectures, etc. The Metropolitan Life Insurance Company agents have been especially helpful in making home contacts, and reference slips were issued admitting children to the free clinics.

This year all free clinics have been abandoned. The usual advertising propaganda is being employed but all of the toxin-antitoxin will be given by private physicians. It is estimated that approximately 1,500 physicians are actively engaged in medical practice and each office becomes an immunization clinic. Any who can afford to pay will be expected to do so. The County Medical Society is suggesting a uniform charge of $1.00 for each immunization. The toxin-antitoxin is furnished by the Health Department. If the individual is without means, the physician, by arrangement, does the work and the Health Department pays $1.50 for each 3 doses of toxin-antitoxin.

This program has been worked out jointly by the Wayne County Medical Society and the Department of Health. There has been some adverse comment in one of the local papers but this publicity has had the good effect of impressing the public with the need for immunization.

Toxin-antitoxin is available at 8 established stations. A record is kept at each station of the amount of material taken by the physician and these reports are collected by the Health Department each evening. With the toxin-antitoxin the physician takes a postcard on which he reports each c.c. used, giving the name, address and age of the child and indicating whether it is the first, second or third dose. A similar card is used for the Schick test. Each physician hangs a poster furnished

by the Health Department in his waiting room recommending toxin-antitoxin for young children.

During the first 8 days of the campaign 1,200 postcards have been received by the Health Department indicating that over 1,000 children have commenced their series of toxin-antitoxin. It is anticipated that with the present plan more preschool children will be reached as the physician's office, which becomes a clinic, is more accessible to the population as a whole. Furthermore, there will be developed a certain consciousness among the physicians of the need of practicing preventive as well as curative medicine. The results may not be so immediately startling as those obtained under the free clinic plan, but ultimately the new procedure should be productive of more widespread interest in preventive medicine.—*Weekly Health Reviews,* Detroit Dept. of Health.

Health Work in Flood Area—Following the emergency establishment of sanitary control of the flood area in the Mississippi Valley in the spring of 1927, plans were developed for the formation of full-time local health service in more than 100 counties. Funds were raised by appropriations from the flood states, the counties, the U. S. Public Health Service and the Rockefeller Foundation. A training school was established at Indianola, Miss., where 235 health workers had received instruction prior to May 1, 1928.

An analysis has been made of the trend of disease incidence in the flood area before and after the flood occurred. Smallpox morbidity has shown marked reduction in 41 counties of the flooded area of Kentucky and Louisiana. In 55 counties in the same states the death rate for malaria has been decreased over a period of 10 years. Pellagra, which has been on the decrease in Kentucky for over 8 years, showed an increase in 1926 and 1927 while in Louisiana the death rate from pellagra has been constant for the 10-year period. The death rates for typhoid, infantile diarrhea and diphtheria for 1927 in the 55 flooded counties of Kentucky and Louisiana did not show any marked variation from the trend for the past 10 years.—C. N. Leach, Progress of Health Work in the Mississippi Flood Area, *J. A. M. A.*, 91: 1595 (Nov. 24), 1928.

Poliomyelitis After-care—The last legislative assembly in California passed an act requiring the State Health Department to provide such services as transportation, materials or appliances as are needed for the treatment of indigent children who have suffered from infantile paralysis. The cost including hospitalization and clinic service is chargeable to the county in which a child resides, the expense of administration being the only financial obligation of the State Health Department. In the year 1927 there were 1274 cases of poliomyelitis in California, of which 812 showed paralysis in one or more muscle groups; 205 were abortive; and 257 were of a type that has not as yet been determined.

The average cost per patient hospitalized under the terms of the recent act amounts to $1,000. The cost has been kept within this amount by a special hospital rate of $4.00 a day and a special operating fee made to the department of health by the orthopedic surgeons. The existing law has not been entirely satisfactory in view of the fact that the financial burden is too severe for some of the counties. It is suggested that some plan be evolved whereby the county pays one-third, the state one-third and some local welfare organization the other third.—W. M. Dickie, The After-care of Poliomyelitis, *J. A. M. A.*, 91: 1417 (Nov. 10), 1928.

LABORATORY

C. C. YOUNG

THE NEWMAN COMBINED FAT EXTRACTION, FIXING AND STAINING SOLUTION FOR USE IN THE DIRECT MICROSCOPIC TECHNIC FOR COUNTING BACTERIA IN MILK

ROBERT S. BREED, Ph. D., FELLOW A. P. H. A.

New York Agricultural Experiment Station, Geneva, N. Y.

IN the January, 1927, number of the *Monthly Bulletin* of the California State Department of Agriculture,* R. W. Newman, bacteriologist for the Dairy Laboratory of the Division of Chemistry of the California department, has been given three formulas that simplify the staining procedure for the direct microscopic technic for counting bacteria in milk. The author does not indicate which solution he prefers, so that many inquiries are being made in regard to the use of these solutions.

After several laboratories, including our own, had tried them out and found that the solutions were satisfactory for the purpose recommended, a footnote referring to them was inserted (p. 23) in the reprinted Fifth Edition of the *Standard Methods of Milk Analysis* † of the American Public Health Association. However, the formulas for the solutions were not given, so this has led to many further inquiries. After several months of experience in our own laboratory where we had found Formula No. 2 to be the most satisfactory, the author of this note wrote to Mr. Newman for a statement in regard to his experience and learns that he too regards No. 2 solution as superior to the others.

His letter reads:

> Of the three solutions, we are using and prefer Formula No. 2. We prefer this solution for two reasons: (1) because of the saving in time in the field as contrasted with Formula No. 1, and (2) because of the added "life" of the solution. Because methylene blue is so soluble in tetrachlorethane, the dye remains in solution even though the alcohol does evaporate. In Formula No. 1, on the contrary, the dye is not soluble in the xylene, and consequently is precipitated out of the solution as the alcohol evaporates. We found that the effective "life" of Solution No. 1 under field conditions was about 5 to 6 months. Solution No. 2 seems to give more satisfactory results in this respect as it does not seem to deteriorate with age. Solution No. 2 has been used exclusively by the inspectors of this department in grading milk in this state for the past two years.

Two persons have reported difficulty with Formula No. 3, apparently caused by impurities in the pyridine which dissolve the dried milk solids. Mr. Newman reports that a shipping clerk in the Eastman Kodak Company once misread a label and sent him tetrachlorethylene in place of tetrachlorethane. Mr. Newman also reports that in order to secure deeper staining he now adds 1.12 gm. of methylene blue per 100 c.c. in place of the 1.00 gm. originally recommended in Formula No. 2. This, however, appears to be a matter of personal pref-

* Also in *Proc. Soc. Exper. Biol. & Med.*, 24: 323–325, 1927.

† Obtainable from the Association, 370 Seventh Avenue, New York, N. Y. Price $.50.

erence as we have had no difficulty in using stains made up with the original formula. The formula recommended is as follows:

FORMULA NO. 2

Methylene blue powder, certified..	1–1.12 gm.
Ethyl alcohol, 95 per cent.....	54 c.c.
Tetrachlorethane, technical*.....	40 c.c.
Acetic acid, glacial.....	6 c.c.

Add alcohol to the tetrachlorethane in a flask and heat to a temperature not to exceed 70° C. (if it is desired to use methyl alcohol, the temperature should not be raised to more than 55–60° C.). Add the combined solution to the powdered methylene blue. Shake vigorously until the dye is completely dissolved. The original directions state that the glacial acetic acid should be added at this point, but Mr. Newman writes that it is better to *cool* the solution before adding acid and that the acid should be added *very slowly*. Further heating of the acid solution should be avoided. Filter and keep in a tightly stoppered bottle.

DIRECTIONS FOR USE

1. Prepare the milk smear.
2. When dry, immerse the smear in the solution and withdraw immediately.
3. Drain until dry (30 seconds).
4. Wash in water.
5. Dry and observe.

This solution permits much more rapid staining than does No. 1 and yields a clear, well stained preparation. The smears readily wash off the slide unless they are dried before washing (Step No. 3). If dried too rapidly the smears present a spongy appearance. If the smears are dipped in 70 per cent alcohol, this trouble may be prevented.

At this time it might be well to mention a simplification of the method of taking samples and preparing the slides that is entirely permissible where the counts obtained are to be used in educational work only, or where preliminary results are used as a means of finding milk supplies that need more careful examination later. In these cases, samples may be dipped from the weigh-vat with a dipper that is thoroughly rinsed in the milk that is to be sampled. The 0.01 c.c. pipette is then inserted directly into this dipper and this amount of milk withdrawn. The smear is spread immediately on a slide and placed on a suitable warm and level drying plate. Satisfactory drying plates are readily made by placing an electric bulb in a tin box. In the majority of milk plants, connections can be made to some electric light fixture with a suitable extension cord.

An experienced worker can prepare slides in this way with samples from each patron almost as rapidly as the milk is dumped and weighed. Ordinarily it is possible to stain the slides in spare moments so that the slides are ready for examination by the time all of the milk has been brought to the plant (usually 9 to 10 A.M.). Thus, it is quite possible to examine an average of 200 samples of milk per day with a great saving in the preparation of sample bottles, provision for icing samples and transportation to a suitable place for making the slides. A single worker using this simplified technic has collected and examined as many as 350 samples in one day.

* Obtainable from Eastman Kodak Co. Technical tetrachlorethane is relatively inexpensive.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Nineteen Twenty-eight a Good Health Year—General health conditions in the United States and Canada have been more than satisfactory during the first 9 months of 1928. In only two prior years, 1927 and 1921, has this year's health record, for any January–September period, been excelled. This is clearly indicated by the mortality record of more than 18,500,000 persons—the industrial policy holders of the Metropolitan Life Insurance Company, who comprise more than one-seventh of the combined population of the two countries. The death rate among approximately 16,000,000 white insured persons, this year, was 8.3 per 1,000. This closely approaches the minimum figures of 8.2, as recorded for the first 9 months of both 1927 and 1921. The rate for approximately 2,500,000 colored persons was 15.5 per 1,000, one of the most favorable mortality figures ever recorded for this large group of insured colored people.

The most important item in this year's health record is the continued drop in the tuberculosis death rate among the white industrial population. It is now entirely safe to announce that the end of 1928 will see the lowest mortality figure ever recorded for tuberculosis in the United States and Canada. Another extremely gratifying development this year is the indication that 1928 will very probably register the lowest death rate for puerperal diseases ever recorded among women in the industrial population. Here both white and colored insured women have shared in the gains. Still another disease, typhoid fever, seems destined to show, in 1928, a lower mortality figure than ever before. With the exception of measles, the four principal communicable diseases of children are causing fewer deaths than in 1927; and even with measles the death rate is well below the average. The improvement in the diphtheria situation is particularly gratifying. Last year the mortality from this disease rose somewhat, after showing a continuous decline over a series of years. Developments in 1928 indicate, however, that the 1927 rise was only a temporarily unfavorable phase of a generally improving situation. Influenza and pneumonia have caused more deaths than last year, but not more than the average. Alcoholism caused 434 deaths during this 9 months' period as compared with 427 during the corresponding months of 1927. The 9 months' mortality record for the external causes of death shows improvement over that made during the similar months of 1927. Deaths due to automobile accidents are still increasing among the colored, but, for the first time in the records of the company, the automobile fatality rate among white persons is lower than in the preceding corresponding period.—*Stat. Bull.*, Met. Life Ins. Co., 10: 1–5 (Oct.), 1928.

The Malaria Record of 1927—The incidence of malaria is very much localized in particular areas, chiefly those that still suffer from defective drainage. The malaria death rate in the registration area for 1926 was 1.9 per 100,000 population, and for 1925, 2.1 per 100,000. The data from 26 cities, chiefly in the South, show that the death rate has declined from 3.9 per 100,000 in 1923 to 2.0 in 1927. In 1923 the

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highest death rates in this group were 22.0 for Shreveport, La., and 15.1 for Tampa, Fla. In 1924 Shreveport again ranked highest with a death rate of 14.2 per 100,000. Augusta, Ga., had a rate of 11.0, and Memphis, Tenn., a death rate of 9.9. In 1925 the highest rate was reported for Augusta, Ga., with 10.9 per 100,000. In 1926 the highest rate was 11.8 for Shreveport, La., followed by Memphis, Tenn., with a rate of 11.3, and Augusta, Ga., with a death rate of 10.8 per 100,000. The highest death rates in 1927 were 10.7 for Augusta, Ga., and 10.5 for Montgomery, Ala. Jackson, Miss., not in the group of 26 cities, reported a malaria death rate of 20.8, which is one of the highest on record for recent years.

In Europe special efforts for malaria eradication are being made by the Health Section of the League of Nations. In Lithuania the number of malaria cases declined from 268 in 1922 to 51 in 1926. In the region of Galatz, Roumania, the number of cases was reduced from 49,896 in 1924 to 20,176 in 1926 as the result of sanitary measures. In the territory of Soviet Russia there was a reduction of about 860,000 cases between 1924 and 1925, and a reduction of 670,000 cases between 1925 and 1926.—Frederick L. Hoffman, *Spectator*, 121: 35–36, 38 (Nov. 15), 1928.

Scottish Vital Statistics, 1927—The seventy-third annual report of the Registrar-General for Scotland records the estimated population of Scotland in the middle of 1927 as being 4,891,953. The deaths registered during the year numbered 65,830, and the death rate was 13.5 per 1,000 population. The deaths for the year were 2,050 more than in 1926. The births for 1927 numbered 96,672 with a birth rate of 19.8 per 1,000. The birth rate for the year is 1.2 less than that of the previous year, and 2.3 less than the mean of the preceding five years. It is the lowest Scottish birth rate yet recorded, the previous lowest being 20.3 in 1917. Subsequent to the termination of the World War, the Scottish birth rate rose and attained a maximum of 28.1 per 1,000 in 1920, but it has since then steadily decreased.

In 1927 the death rate from malignant disease was 141 per 100,000 population. In 1926 it was 136 and averaged 132 for the preceding 5 years. The total death rate for tuberculosis was 100 per 100,000 population, while from tuberculosis of the respiratory system it was 71 per 100,000. There was a death rate of 6.4 per 1,000 registered births for diseases and accidents of pregnancy and parturition. There were 152 deaths by coal gas poisoning for the year and 448 from motor car accidents.

A relatively small proportion of children born in 1926 were reported to have been successfully vaccinated. Of the 36,376 unvaccinated children, 30,804 were exempted from vaccination because of conscientious objection on the part of their parents.—*Med. Off.*, 40: 158 (Oct. 13), 1928.

Public Health in Western Samoa—The population of Western Samoa was 42,865 on December 31, 1927. It consisted of 39,215 Samoans, 2,564 Europeans, 939 Chinese laborers and 147 Melanesian laborers. The births of 1,636 living children were registered during 1927, giving a birth rate of 42.4 per 1,000 of the native population. The deaths numbered 495, giving a death rate of 12.8. The increase of the population was 29.6 per 1,000, and this is far in excess of the natural increase of any European country. In 1926 there was a birth rate of 52.6 and in 1925, 56.3. The death rates for 1926 and 1925 were 19.4 and 23.8 respectively. The decrease in mortality is probably due to a reduction of epidemic disease. In 1925 there was an

epidemic of whooping cough which caused over 200 deaths. In 1926, 53 deaths were due to an outbreak of dysentery and 25 were attributed to an influenza epidemic. In 1927 there was no epidemic disease. The infant mortality rate was 101 per 1,000 live births in 1927, 106 in 1926, 186 in 1925 and 153 in 1924.

There were 46 cases of lobar and 8 of bronchial pneumonia treated in the hospital. There were 9 pulmonary, 2 peritoneal and 6 meningeal tuberculosis cases treated. Three cases of puerperal septicemia and 23 cases of enteric fever were treated. More and more cases of cancer among Samoans are coming to light. Fourteen cases, of which 7 were carcinoma of the stomach, 3 of the intestines and 2 of the uterus, were treated during the year. An extensive campaign against hookworm and yaws commenced in 1923. Treatment was given for 606 cases of hookworm during 1927, and no bad cases were found. The total number of N. A. B. injections against yaws was 7,450.—Public Health in the Mandated Territory of Western Samoa, *League of Nations Epidemiological Report,* Oct. 15, 1928, pp. 379–380.

Medical Conditions in the South Pacific—The infant mortality in the islands of the South Pacific is very high, being estimated previous to 1922 at 200 to 300 per 1,000 births. In 1923 there was an infant mortality rate of 167 per 1,000 births in Fiji, a rate of 136 in Tonga and 200 in Western Samoa. General health measures had reduced the rates by 1926 to 155 for Fiji, 102 for Tonga and 106 for Western Samoa, although an epidemic of whooping cough in 1925 caused the abnormally high infant mortality rates of 172, 295 and 186 per 1,000 births in the three respective districts. Modern principles of medicine maintained the birth rate in Western Samoa at over 50 and reduced the death rate to under 20 between 1923 and 1927.

Yaws is common among the people of the Pacific Islands, and was a great problem until the recent introduction of arsenicals for treatment. Syphilis is rare seemingly because of the prevalence of yaws. Leprosy is common and spreading in the New Hebrides, but is not so prevalent in the Solomon Islands and New Guinea. Vaccination against smallpox is given in the ports of Papua and New Guinea. Fiji vaccinates a few thousand each year, but otherwise native populations are protected only by quarantine at ports of entry. Measles is now endemic in Fiji, Samoa, Tonga, the Cook Islands and the New Hebrides, and diphtheria occurs in a mild form in many of the islands. Tuberculosis is the immediate cause of more deaths than any other disease in the Pacific. The commonest form in which it appears is pulmonary tuberculosis. Glandular and peritoneal tuberculosis are less common and bone infections are rare. There have been epidemics of influenza in the islands for over one hundred years. In 1918 from 10 per cent to 20 per cent of the various native groups died from influenza. Typhoid fever occurs in a mild form in Melanesia but in Fiji, Tonga and the Cook Islands it is at times endemic or epidemic. The control of malaria is one of the most difficult problems in the islands, and in such countries as Papua, New Guinea, the Solomon Islands and the New Hebrides would be an impossible expense. The whole southern coast of Papua is malarious although this condition diminishes in the Delta Region of Western Papua. Samoa and Tonga are the most forward of the groups in sanitation and water supply, but in most of the villages very primitive conditions exist.—S. M. Lambert, *M. J. Australia,* 2: 362–378 (Sept. 22), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

DISCUSSION OF "SANITATION OF WATERSHEDS"*

Warren J. Scott, Director, Bureau of Sanitary Engineering, Connecticut State Dept. of Health, Hartford, Conn.—Possibly it is because I too am from New England that I agree with Mr. Chase's discussion in that it advises that caution should be exercised in the modification of the old New England policy of reliance upon clean watersheds and storage for water supplies relatively free from pollution.

It seems to me that the committee † of this Association referred to by Mr. Chase has gone rather far in its emphasis on the remoteness of the dangers of bathing in public water supplies and of other recreational uses. It is difficult for a committee to generalize on policies which must of necessity vary for different sections of the country. I do not blame the committee for recognizing that the limitation of the recreational use of watersheds must be on a reasonable basis.

It is true that public opinion, in the face of too strict standards, may force a complete about-face and let down the bars too far. In some cases, the derivation of a small water supply from a large watershed under too strict regulation may work a hardship on a far greater number of persons than are benefited. The reverse is usually true in Connecticut. Another consideration is the taking of watersheds that are now used for purposes of recreation for additional water supply purposes.

On the other hand, advocacy of the relaxation of present standards for clean watersheds as practiced in New England and elsewhere should certainly not emanate from public health authorities or public health associations.

In most of New England, the statute law with regard to bathing, fishing, and other recreational uses, appears to be based upon the fact that to drink the water or to secure it uncontaminated is the primary right. Bathing and other recreational uses which pollute the water are considered as a secondary right which may be taken away as a matter of public policy.

Looking at the question of recreational use of water supplies solely from the standpoint of health, what happens if water supplies now dependent only upon clean watersheds and some storage are opened for unrestricted recreation? It may be said that the community using the water will have to install treatment. If treatment is adopted and properly supervised, the health hazard may be less than formerly. Treatment, of course, is always desirable as an additional form of protection. But would treatment be installed in many cases? and if so, what would the type of treatment be? In many of our small New England communities using small gravity supplies with widely varying rates of consumption, chlorination is difficult and unreliable unless it is possible to install an equalizing reservoir. The latter may be comparatively expensive for a small

* In the November, 1928, issue of the JOURNAL, there appeared a paper by E. Sherman Chase on Sanitation of Watersheds. Viewpoints of others on the same question, while not always in agreement, usually are enlightening. Hence, two discussions of Mr. Chase's paper are presented here.

† Committee on Water Supplies.

community, and this might also be true of filtration. Even if treatment were installed on a small water supply, it might be poorly supervised, with resultant danger. The answer then, from the standpoint of the health worker, is that the community is likely to face another distinct health hazard which does not now exist. And yet the benefits from the recreational standpoint may be slight.

It is possible that public opinion may eventually bring about a modification of our present New England policies, and if so, the problems attendant on such modification will have to be met. Possibly the use of a new water supply which takes away existing benefits of recreational use should be accompanied by suitable treatment to avoid the loss of these benefits. Additional treatment works and land purchases may be required to an increasing degree to overcome the dangers from less stringent watershed regulations. But as public health workers, it seems to me that we should work toward making any changes gradually. We should not belittle the very real dangers of recreational use of water supplies any more than we should close our eyes against the need for a reasonable public policy. Any modification of existing policies should be made with due regard to the local conditions and after due consideration of the hazards created and the practicability of adoption of means of combating them as well as the recreational benefits to be derived.

H. E. Moses, Asst. Chief Engineer, Pennsylvania State Dept. of Health, Harrisburg, Pa.—Properly the author confines the subject to the sparsely settled watershed, where control measures have a reasonable chance of being effective. Here two main problems must be dealt with; namely, those relating to:

1. The permanent population on the shed
2. The transient population on the shed

With respect to the first, state laws and regulations, where adequate, permit health departments to enforce sanitation measures. These will be effective in so far as they are practicable and as the laws are wisely administered. But the real problem—and the growing one—has to do with the transient population passing over the watershed. We may have uninhabited watersheds but the unvisited catchment area is fast becoming a rarity.

Possibly the most pressing need relates to the hazard created by the recreational use of watersheds. This includes camping, hunting, fishing and bathing. These practices raise real problems for the water works officials and the health authorities. Fishermen are insisting on their so-called inherent right to use not only the streams but also the reservoirs for fishing purposes. Camps and colonies on watersheds are rapidly increasing, and swimming and bathing are growing in popularity.

Akin to this phase of the question is the matter of riparian ownership of land abutting on water used as a source of public water supply. It is understood that such riparian owner has an inherent right to the reasonable use of the stream, including bathing, for himself, his family, servants, and invited guests. This probably holds so long as the riparian owner does not commercialize this use of the stream.

The solution of the problem must be reasonable and practicable and at the same time not serve to arouse such antagonism as to result in adverse legislation. A good example of the extremes to which a legislature may go when sufficiently urged by the people is the New Jersey case where in 1927 the Legislature passed an act which was vetoed by the governor, repassed over his veto, and is now a law. This statute reads: "It shall be lawful to bathe or swim in any of the fresh waters

of this state, provided that in so doing no trespass be committed. This act shall take effect immediately." This case probably represents an extreme measure but is cited to show a tendency in that direction.

In an attempt to find some measuring stick of more or less general application these two general principles are suggested:

First, where the reservoir does not have a nominal long-time storage and where ways and means have not been installed or are not being operated to safeguard the sanitary quality of the water delivered to the consumers and where the catchment area is relatively uninhabited and untraversed by much traveled highways, the recreational use of the catchment area does constitute a menace to the public health.

Second, where the nominal retention of the water in the reservoir can be construed as adequate long-time storage, and where ways and means have been installed and are being operated to safeguard the sanitary quality of the water delivered to the consumers, and the catchment area is inhabited or traversed by extensively used highways, the recreational use of such a catchment area does not constitute a menace to the public health because the persons so using these areas do not add an undue burden upon the self-purification to be obtained from the assured long-time storage and from the artificial ways and means which have been installed and are being operated to safeguard the sanitary quality of the water delivered to the consumers. Hence, in such cases, consideration might be given to permitting the public a restricted use of the watershed area, exclusive of the reservoir and the margins thereof.

Certain protective measures, some of which have been mentioned by Mr. Chase, merit brief discussion:

1. Ownership of Watershed—This is basically an economic problem and must be determined by the respective merits of ownership versus protective measures and purification. Its effectiveness is dependent on the extent of watershed control and grows less practical as the size of the watershed increases. Where it owns the watershed, the water company can invoke trespass laws. Certainly the reservoir site and the shore margins should be owned or definitely under the control of the water company.

2. Zoning—This practice is not applicable except on company controlled or state owned land. Elsewhere private ownership prevents.

3. Placarding—This is practical on small areas. Its effectiveness is uncertain but it is probably beneficial.

4. Sanitary Control—Within rather circumscribed limits, it can be administered under existing laws, health regulations and with available personnel.

5. Education of Public—Undoubtedly this is of value, but it must be persistent and continued. It will not control the careless or vicious.

6. Legislation—This must be reasonable, capable of enforcement, with sufficient elasticity to be applicable to the varying conditions encountered. If it is too drastic, it is difficult of enforcement and arouses militant opposition, possibly defeating its purpose, which may be entirely proper.

But after all, must not these be considered as palliatives, and, valuable as they may be, as not solving the problem completely.

We in Pennsylvania have come to believe that no surface supply, valuable as may be the sanitation measures on the watershed—and they are needed—is safe without at least chlorination. This is heresy, perhaps, but nevertheless our profound conviction.

Sewage Agitation and Chlorination Tests at Havre, Mont.—During the summer months the Milk River, on which Havre is located, has not suffi-

cient flow adequately to oxidize the city's sewage. An agitation and chlorination plant was established at the outlet of one of three main sewer outlets with the following results:

Agitation reduced suspended solids from 0.882 per cent to 0.102 per cent, a reduction of 88 per cent; no marked difference was noted in the amount of settleable solids before and after agitation. With agitation only, there was an average reduction of hydrogen sulphide of 26.5 per cent (from 4.08 to 3 p.p.m.); agitation combined with chlorination gave an average reduction of hydrogen sulphide of 63 per cent; bacterial reductions were great; chlorine residual after 10 minutes was maintained between 0.5 and 1.0 p.p.m.; cost of operating plant one month was estimated at $110. This plant treated about 0.122 m.g.d.—Emil Sandquist and H. B. Foote, *Eng. News-Rec.*, 26, 100: 1001–1002 (June), 1928. Abstr. R. J. Faust.

Treatment of Tomato Cannery Wastes—Experiments conducted by the Bureau of Sanitary Engineering of the Maryland State Health Department at a tomato canning factory indicated that the liquid wastes could be clarified by precipitation with 6 gm. of lime and 4 gm. of ferrous sulphate per gal., or by absolutely quiescent sedimentation for 18 to 24 hours without the use of precipitants.—Anon., *Pub. Works*, 2, 59: 65 (Feb.), 1928. Abstr. D. E. Kepner.

Experiences with Covered and Open Reservoirs—Three years' bacterial, microscopic and chemical tests on an open and a closed reservoir in the city of Washington, D. C., both receiving the same supply from the slow sand filtration plant, chlorination then being intermittent, showed the following:

Average bacteria count 4 for filtered water, 7.6 for the covered reservoir, an increase of only 90 per cent, compared with 44 for the open basin, an increase of 1,000 per cent. There was no growth of microörganisms in the covered reservoir, whereas it was abundant in the open. Albuminoid ammonia, nitrate and nitrate tests also all showed much better conditions in the covered basin at all times.—Carl J. Lauter, *Eng. News-Rec.*, 25, 100: 963–964 (June), 1928. Abstr. R. J. Faust.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Special Bibliographies Available—Those who are interested in the bibliographies prepared by the below mentioned committees, which bibliographies are too extensive to be included with the published reports of the respective committees, may obtain the same by addressing the chairmen of the committees in question, or the secretary of the Industrial Hygiene Section, Carey P. McCord, M.D. (Industrial Conservancy Laboratories, 34 W. 7th St., Cincinnati, Ohio). Bibliographies cover recent years:

Industrial Fatigue and Allied Subjects, Eugene L. Fisk, Chairman of Committee, c/o Life Extension Institute, 25 W. 43d St., New York, N. Y.

Lead Poisoning in the United States, Carey P. McCord, Chairman of Committee (see address above).

Skin Irritants, Henry Field Smyth, Chairman of Committee, Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

The Compensation Law and Its Application to Lead Cases—The New York law schedules 19 occupational diseases subject to compensation, and defines disability as "the state of being disabled from earning full wages at which the employe was last employed." Occupational disease disablement is treated as an accident with the right to compensate within 12 months of contraction. Presumption as to the cause of an occupational disease is deemed acceptable if the exposure has been to one of the processes mentioned in the second column of the schedules of diseases. The term "lead poisoning" lacks a standard definition of general acceptance. Some will not diagnose a case of lead poisoning unless colic is present; still others only when the presence of stippled cells is noted, etc. Due to this confusion it has been put forward from the standpoint solely of medical terminology that this term be arbitrarily and definitely confined only to the toxic episodes, namely, colic, lead palsy, or encephalopathy; and that "lead absorption" be used to cover all other cases of lead which has been absorbed into the body. Considered from this point of view "lead poisoning" becomes a subdivision of lead absorption—the term "poisoning" being confined to cases of lead absorption presenting acute manifestations.

The plain intent of the New York law is to compensate the given disease well before the acute stage results in total disability, so that the term "lead absorption" is synonymous under the law with the term "lead poisoning." For this reason it is argued that the former term be substituted for the latter in the compensation law. The following fundamental points regarding lead absorption should be kept in mind:

1. In any given individual, lead may be present in his body either in toxic or non-toxic form. In an individual where all of the lead present in his body has been stored in his bones, it is non-toxic to him for the time being.

2. Lead which is present, however, in the circulating blood may be either toxic or non-toxic, depending upon the quantity of lead present. It is only in those cases where toxic quantities of lead appear in the circulation that any incapacity may occur, and it is only those cases which are, therefore, of any interest to the Compensation Tribunal.

3. Lead workers are just as subject as any individual to the ordinary ailments such as ordinary stomach ache, gastric ulcer, ap-

pendicitis, etc. It is quite obvious, therefore, that all other causes be definitely eliminated in considering the health of a lead worker quite as much as in making a differential diagnosis in any other individual.

Confining ourselves to those cases where lead is thought to be actively present in the body in toxic amounts, resulting in clinical manifestations of disability, we may divide these for the present purpose into two groups, depending upon whether the manifestations are such as to produce definite demonstrable disability, or are merely subjective, resulting in a claimed disability, the existence of which may be difficult to prove.

I. Cases with Positive Disability
   A. Cases with Positive Laboratory Findings (Procedure given)
   B. Cases with Negative Laboratory Findings (Procedure given)
II. Cases with Doubtful Disability (Diagnostic Possibilities)

The importance of laboratory examinations of both blood and urine in every lead case cannot be overemphasized.

A new bulletin on the subject of Lead Poisoning in New York State, with special reference to the study of the health of 381 lead workers, is now in the hands of the printer and will be ready for distribution in the near future. This bulletin will be mailed to anyone interested, upon request.—May R. Mayers, *Indust. Hyg. Bull.*, N. Y. State Dept. of Labor, V, 4 (Oct.), 1928.

A New Test for Industrial Lead Poisoning—Following upon a previous report by McCord, Minster, and Rehm in 1924, the author gives the summary and later experience with his counting method of estimating the number of basophilic cells in cases of lead poisoning. The importance of lead poisoning includes its ingestion without absorption, with absorption, and with intoxication. Immature red cells are produced in the bone marrow having certain characteristics of which basophilic substance appears to be the most constant and includes polychromatophilia or polychromasia, punctate stippling and basophilic aggregations. The methods of detecting basophilic material with Wright's stain, Robertson's method for counting of reticulated cells, also Cunningham's method, the Friedlander-Wiedemer method of enumeration of basophilic red cells and the basophilic aggregation test of the author are reviewed. Clinical and laboratory materials necessary are given, also illustrations of blood findings and a discussion of basophilic red cells in normal persons and as an index of exposure to lead, and in clinical lead poisoning with case citations.

Among fifteen points included in the summary are these: The number of basophilic red cells found in 145 normal adults was commonly less than 1,000 per cu. mm. of blood, and rarely exceeded 5,000 in certain physiologic states. The number of such cells is increased above normal in the following pathologic states:

Lead intoxication, benzol poisoning, arsenic poisoning, in all types of anemia in which there is regeneration, hemolytic icterus, following hemorrhage, leukemias, at times in acute infections, in neoplasms involving the bone marrow, and in polycythemia.

In the absence of other conditions presenting high basophilic red cell counts a high basophilic red cell count in a person exposed to lead is accepted as indicative of lead absorption or lead poisoning.

The application of these methods suggests that in lead industries many workers commonly regarded as unexposed, such as office workers, clerks, etc., actually may also absorb much lead and thus become potential cases of lead intoxication. This is especially true if the hazard of lead is in the form of dust.—Carey P. McCord, *U. S. Bur. of Labor Statistics*, No. 460 (Apr.), 1928, 33 pages.

Health of Workers in Dusty Trades—The U. S. Public Health Service has completed a study of the health of workers in a Portland cement plant, the first of a series covering the dusty trades, according to an announcement recently made by Surgeon-General H. S. Cumming. The study was undertaken to ascertain whether persons

working in an atmosphere containing numerous minute particles of a calcium dust suffered any harmful effects. The investigation was conducted in one of the older, dustier plants, so that the effect of large quantities of the dust could be observed. Records of all absences from work were kept for 3 years, and the nature of disabling sickness was ascertained. Physical examinations were made, X-ray films taken, and the character and amounts of dust in the atmosphere of the plant were determined.

The results of this investigation indicated that the calcium dusts generated in the process of manufacturing Portland cement do not predispose workers to tuberculosis nor to pneumonia. The workers exposed to dust experienced, however, an abnormal number of attacks of diseases of the upper respiratory tract, especially colds, acute bronchitis, diseases of the pharynx and tonsils, and also influenza, or grippe. Attacks of these diseases serious enough to cause absence for two consecutive working days or longer occurred among the men in the dustier departments at a rate which was about 60 per cent above that of the men in the comparatively non-dusty departments. Limestone dust appeared to be slightly more deleterious in this respect than cement dust.

Outdoor work in all kinds of weather such as was experienced by the quarry workers appeared to predispose to diseases of the upper respiratory tract even more than did exposure to the calcium dusts. In the outdoor departments of the plant, also, the highest attack rates of rheumatism were found. The study also indicated that work in a cement dusty atmosphere may predispose to certain skin diseases such as boils, to conjunctivitis, and to deafness when cement dust in combination with ear wax forms plugs in the external ear. When the dust in the atmosphere is less than about 10 million particles per cu. ft. of air it is doubtful whether the above-mentioned diseases and conditions would be found at greater than average frequency.

Modernization of plants and installation of ventilating systems are helping to solve the dust problem of the industry.—*Health News*, U. S. P. H. S., E-19, 1928.

Industrial Hygiene in Model Health Ordinances—The following is excerpted from the Progress Report of the Sub-Committee on Model Health Ordinances, presented at the Chicago meeting of the American Public Health Association, October 15, 1928:

Institutional and Occupational Care

1. There should be an ordinance giving the Board of Health authority to license and supervise certain classes of occupations and institutions relating in any way to public health and such regulations should include hospitals, dispensaries, institutions, laboratories, homes for children, midwives, and occupations likely to be a hazard to health.

Industrial Hygiene

1. There should be an ordinance which provides that all manufacturing and industrial plants where processes are used which are dangerous to the health of the workers be subject to special rules and regulations of the Board of Health.

Health Hazards in Chromium Plating—Chromium plating is developing rapidly in the United States. It has long been known that, in the manufacture of chromic acid and chromates, the operators are subject to attack by an ulcerative process and perforation of the nasal septum; and to the formation of ulcers or "chrome holes" upon the hands or other exposed parts of the body. Accordingly, some provisions have been made in all chromium plating plants for artificial ventilation and for other sanitary measures. In spite of these precautions, however, the employes in some plants have been affected in the above mentioned ways.

In order, therefore, to determine the extent of the hazard and the best means of overcoming it, a survey was conducted in several commercial plants. This included a study of the methods and degree of ventilation, of the concentrations of chromic acid in the air breathed by the workers, and a physical examination of the workers themselves. Although only 6 plants were visited, and 23 persons examined, the results were so consistent in different plants, and agreed so well with previous experience with chromates, that certain tentative conclusions and recommendations are warranted.

It was found that exposure to very low concentrations of chromic acid, e.g., one mg. in 10 cu. m. of air, or 1/60 gr. in 350 cu. ft. (which may be considered approximately the volume of air breathed by a worker in eight hours), is sufficient to cause nose bleed and nasal inflammation in a week or less. Higher concentrations or longer exposures cause extensive attack and even complete perforation of the nasal septum. This is painless, however, and the operator may be entirely unaware of the perforation. Many of the employes were found to have chromium ulcers on the hands or other exposed parts of the body. No evidence was found of injury to the respiratory tract except in the nose, nor of any effect upon the digestive system or the kidneys.

While, therefore, there is a real hazard in chromium plating, it is not critical, and can be entirely eliminated by suitable measures. These should include an effective system of ventilation in which the air is drawn horizontally across the plating tanks into a narrow duct in which the air velocity should be about 2,000 feet per minute. So far as possible, rubber gloves, aprons, and shoes should be worn. Frequent applications of vaseline or mentholatum salve to the nose and hands greatly reduce the danger of ulceration. All cuts and abrasions of the skin should receive regular inspection and medical treatment.

If these simple, entirely practicable measures are taken, the hazard can be practically eliminated. There is no reason, therefore, to fear any serious injuries from the extension of chromium plating that is likely to occur in the next few years.—*Health News*, U. S. P. H. S., 38, 1928.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Continued Administration of Iodide and Other Salts. Comparative Effects on Weight and Growth of the Body—Criticism directed against the continued administration of iodide in small amounts and the lack of any study of the action of these compounds over long periods has prompted this investigation. Experiments were carried on for a period of 4 years with rats as experimental animals. The rats were maintained on an adequate diet which included yeast, cod liver oil, and Osborne and Mendel salt mixture which contains about 0.0032 per cent of potassium iodide. Dry sodium iodide was administered in a concentration of 0.01 per cent, corresponding to approximately 1 mg. daily per rat, a dosage corresponding to about 0.23 gm. (3½ gr.) daily for an adult of 70 kg. body weight. This dosage corresponds to the iodide

medication in simple goiter and for certain chronic inflammations and is much greater than the daily dose of iodide received from the use of iodized table salt.

Other salts were tried: sodium sulphocyanate in concentration of 0.007 per cent; sodium bromide, 0.0054 per cent, representing respectively daily doses of about 0.6 and 0.5 mg.; arsenic, as Fowler's solution, in concentration of 0.01 per cent of arsenous oxide, the daily dose per rat being 0.76 mg. arsenic trioxide; sodium borate in a concentration of 0.014 per cent, the daily dosage being 1.12 mg. per rat; thallium acetate in a concentration of 0.0014 per cent, or 0.11 mg. per day per rat. Results are shown in graphs, curves representing median values at the end of each month, although weekly records were kept. The conclusions with respect to iodide are: (1) increase in body weight or growth some time during the course of the experiment; (2) in contrast with the iodide and generally with the controls, reduction in body weight and growth after medication with other salts. Approximately for all iodide groups the increase is about 10 or 15 per cent. Rats on the iodized food consumed the same amount as controls on untreated foods, and the body weight increases are apparently, therefore, independent of the food consumption. Only one group showed a loss of body weight over a period of 7 months but the consumption in this case was 6 per cent less than that of the controls. Rats on a deficient diet were given iodide, also arsenic and manganese. The iodides improved growth and prolonged life while rats on arsenic and manganese showed loss in weight and earlier death than both the iodide and the control rats. The results with other salts showed that sulphocyanate was responsible for a loss in body weight of approximately 10 per cent and the daily consumption of food was also less. With arsenic in two experiments losses in body weight of 20 and 10 per cent respectively occurred and food consumption was reduced about 22 and 10 per cent. Sodium borate, over 7 months, caused an approximate loss of 17 per cent in body weight and a reduction of food consumption of 10 per cent. Thallium acetate was the most toxic of all, causing the death of one group at the end of 4 months. Body weight was decreased 13 per cent and food consumption 16 per cent. The depilatory action of thallium appeared at the end of 6 weeks and sudden fatalities in the rats appeared disproportionately with the loss of weight and food consumption. Sodium bromide resulted in a loss of 11 per cent body weight and 2.2 per cent in food consumption. These experiments confirm the work of previous investigators in reference to the toxic effect of arsenic and boron and correlate the recently reported experiments on the increase in production of milk after the administration of iodides to cows. The authors conclude that there is no ground for the belief that continued use of small doses of iodides under ordinary conditions would have a deleterious effect but there is reason to believe that it will be beneficial. The conclusions, however, do not apply to the administration of the drug in large doses.—P. J. Hanzlik, E. P. Talbot, and E. E. Gibson, *Arch. Int. Med.*, 42: 579 (Oct.), 1928.

Dietary Requirements for Fertility and Lactation: The Vitamin A Content of Wheat Oil—This study was undertaken to determine the vitamin A content of wheat oil in view of conflicting reports of other investigators, particularly since wheat oil is used by most investigators for the study of vitamin E. Young rats, after weaning, were allowed to remain with the lactating mothers on a diet deficient in fat-soluble vitamins until the development of ophthalmia. Wheat oil was adminis-

tered separately from the ration in carefully measured graduated amounts and the controls received comparable amounts of cod liver oil. The wheat oil was administered in dosages of 0.01 c.c., 0.05 c.c. and 0.1 c.c. per animal per day. The animals were weighed twice a week and food consumption records kept. In the experiment in which 0.01 c.c. wheat oil was fed not all the animals maintained good growth, and the results show that this amount is not even comparable with 0.01 c.c. cod liver oil for vitamin A. Better results were secured with the administration of 0.05 c.c. wheat oil. A daily dosage of 0.1 c.c. wheat oil resulted in completely clearing advanced ophthalmia in 17 days. It is noted that the rats on wheat oil which was ineffectual in curing ophthalmia showed a marked reduction in food intake until complete inanition occurred. It is concluded from this that the vitamin A is an important factor, together with vitamin B, in conditions of anorexia. This experiment shows conclusively that there are appreciable amounts of vitamin A in wheat oil sufficient to maintain excellent growth for a period of 10 to 16 weeks.—Barnett Sure, *J. Agri. Res.*, 37: 93 (July 15), 1928.

Blood Regeneration in Severe Anemia. XII. Potent Influence of Inorganic Ash of Apricots, Liver, Kidney, and Pineapple—Two of the authors (Robscheit-Robbins and Whipple) observed 8 years ago that apricot feeding had a beneficial effect in experimental anemia in dogs. Two hundred gm. of this fruit (or peaches) increased the hemoglobin 40 to 45 gm. above the controls for a 2-week period. Since the salts were regarded as a potent agent, this experiment was undertaken to observe the effects of feeding ash to anemic dogs. Standard bread was used which maintains the hemoglobin production at a low level, 1 to 3 gm. of hemoglobin per week. A method is given for the preparation of pure ash from liver and other substances without adding any chemicals to aid incineration. The ashes were analyzed for organic matter, silica, copper, antimony, iron and aluminum, calcium, magnesium and phosphates. Apricot ash proved a stimulant to hemoglobin production over a 2-week period from 42 to 65 gm., the average of the whole series being 40 to 50 gm. hemoglobin. Liver ash feeding over the same period shows production of 38 to 65 gm. hemoglobin above controls. The liver ash experiments showed the same "carry over" into 2 or 3 weeks of the after period as noted with fresh liver. Kidney ash is similar to liver ash. Pineapple ash was found much less potent than other ashes. This product was not prepared by the experimenters but was obtained from Hawaii. A table is given of the average values of the elements in the ash analyses in which it is noted that copper is high in the apricot ash but abundant in all. Iron is also abundant but more so in kidney ash. Experiments show that the ash of dried apricot retained most of the potency of the whole apricot but that beef liver and pig kidney each contains about one-half the potent factors present in the whole cooked organs.—Frieda S. Robscheit-Robbins, C. A. Elden, Warren M. Sperry, and G. H. Whipple, *J. Biol. Chem.*, 79: 563 (Oct.), 1928.

Blood Regeneration in Severe Anemia. XIII. Influence of Certain Copper Salts upon Hemoglobin Output—The presence of iron and copper in ash of certain foods which have been shown to have a profound effect in blood regeneration in severe anemia has led to a study of the inorganic constituents, particularly iron and copper salts. Copper sulfate in small doses, 65 mg. copper (252 mg. of copper sulfate per day), results in increase of about 20

gm. hemoglobin over a 2-week period. Larger doses of copper cause lack of appetite. Copper tartrate was found to be no more potent than copper sulfate. Copper salts mixed with iron salts are much more potent than copper salts alone. Twenty mg. of copper and 36 mg. of iron as metal in daily doses resulted in an increase of 42 to 80 gm. hemoglobin over a 2-week period. An experiment in which a large dose of ferric chloride and an average dose of copper tartrate were given showed an increase in hemoglobin which was regarded as no more than that which would be due to the iron alone. Similar experiments with copper and zinc resulted in hemoglobin production no more than would be expected from the amount of copper alone.—C. A. Elden, Warren M. Sperry, Frieda A. Robscheit-Robbins, and G. H. Whipple, *J. Biol. Chem.*, 79: 577 (Oct.), 1928.

The Iodine Content of Cape Cod Cranberries—The iodine content of cranberries grown in southeastern Massachusetts is of interest because of the nearness of the sea, which affects the ground waters. Three lots of cranberries were analyzed—one from stored crates awaiting shipment, one from a bog on a strip of land called Sandy Neck, and the third from a bog in the center of Nantucket Island. Several charges of 500 gm. each were analyzed by the method of Von Fellenberg. Cranberries from Sandy Neck, which is nearest to the sea, showed 35 parts iodine per billion, while those from the crates showed 26 parts per billion and those from Nantucket showed 27 parts per billion. Von Fellenberg (*Biochem. Ztschr.*, 139: 371, 1923) reported figures showing iodine content of certain foods as follows: apples without cores 1 to 6 parts of iodine per billion; orange pulp 16 parts; potatoes 11 to 18 parts; cabbage 6 to 20 parts; lettuce 6 to 18 parts. When compared with these figures, cranberries from southeastern Massachusetts have a relatively high content of iodine.—Fred W. Morse, *J. Biol. Chem.*, 79: 409 (Oct.), 1928.

A Comparison of Raw, Pasteurized, Evaporated and Dried Milk as Sources of Calcium and Phosphorus for the Human Subject—Calcium and phosphorus balance experiments were carried out in 3 series, both children and adults being used as subjects. Foods were bought in quantity so that the composition would not vary. A standard brand of dried milk made by the spray process and a popular brand of evaporated milk were used in all experiments. Tables are given showing the different foods and amounts given, together with the calcium and phosphorus balances. Experiments with five children showed that the child retains more calcium when it is supplied in fresh milk than when supplied in dried milk. All adult subjects showed more favorable calcium balances with fresh milk than with dried milk. Pasteurized milk was less favorable than fresh milk while milk from cows which were kept in a barn away from sunlight was less favorable than the fresh milk. Evaporated milk showed balances as good as fresh milk. Phosphorus balances were about the same as the calcium although the amount of milk used supplied smaller proportions of the phosphorus of the diet.—Martha M. Kramer, Esther Latzke, and Mary Margaret Shaw, *J. Biol. Chem.*, 79: 283 (Sept.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Preschool Health Supervision in a Large City by a Voluntary Agency—The Minneapolis Infant Welfare Society as a result of 8 years' experience with preschool clinics has gradually extended habit training to the infant clinics and has also increased the upper age limit of infants to 4 years. "A progress chart of the infant's mental development and habit formation is kept from the 12th month to the 4th year; if any difficult problem arises the case is turned over to the preschool department for more intensive study." In the preschool clinic itself 70 per cent of the children are referred from the infant department.

An interesting and sound feature of these clinics is that habit problems are considered along with physical defects by the regular clinic staff, thus treating the child as an entity and not as a dissociated personality. Unusually difficult cases in the mental field are referred to the Child Guidance Clinic of the public schools. There is intensive follow-up of all cases in the homes.

Tables accompany this paper analyzing 400 consecutive cases attending the clinic. One of these "presenting the conditioning factors shows that, outside of 137 physical conditions, the majority of factors resided in the parents or environment, a potent argument for parental education." Most of the children were brought to the clinic because the parents felt there was a physical basis for their ills.

It is interesting to note that there are given as the most important two causes of failure in the clinic "poor coöperation on the part of the parents and failure of parents to improve even though they tried to coöperate."—From a paper given before the A. C. H. A. and A. P. H. A. Annual Meeting, 1928, by E. J. Huenekens, M.D.

Filling the Teeth of the Preschool Child—The national Congress of Parents and Teachers complains, according to the *Journal of the American Dental Association,* that parents of young children are unable in many instances to get dentists to attend to the deciduous teeth. This has come to light as a result of the summer round-up of children about to enter school for the first time in the fall. The dental journal's comment goes on to say that an examination of 1,087 second grade children in 40 different localities in Michigan showed that almost half of them had infected deciduous teeth.

A symposium is quoted dealing with the point in question. It demonstrates quite conclusively what stand is taken by various leaders in the dental profession. A few of the opinions expressed are quoted below:

C. J. Lyons, D.D.S., Professor of Oral Surgery, University of Michigan:

An old tradition that deciduous teeth under all conditions should be retained until their successors erupt is one that today is responsible for much illness among school children. Much greater harm will be done the little patient by leaving the infected tooth in the mouth at any age than will be done by extracting it. When caries in deciduous teeth has progressed to a point where fillings cannot be retained these teeth should be extracted regardless of the age of the child.

Harris R. C. Wilson, D.D.S., Director Cleveland School Dental Clinics:

The mesio distal dimensions of the bicuspids are completed at 5 or 6 years of age, if not

at 4; therefore these bicuspids are as large as they ever will be. . . . The problem of holding space with the temporary molars after 6 years of age is practically nil. At 3 years of age, I grant that the retention of the temporary molars is decidedly important; but even in this case, 3 years of age, I should not submit a child to the danger of serious infection from a non-vital temporary molar. . . . The old idea of holding space is obsolete in the mind of men who have had clinical experience of any considerable volume.

A. C. Thompson, D.D.S., Director Dental Service, Detroit Dept. of Health:

We find in our schools thousands of children with abscessed teeth due to lack of care. It has been our policy to remove every infected tooth that cannot be rendered free from infection. An abscessed temporary tooth uncared for is just as dangerous as an abscessed permanent tooth. Neither one should be tolerated.

From *Bull. Mich. State Dental Soc.*, Sept., 1928.

Dental Health Educational Materials—The old slogan "A Clean Tooth Never Decays" has done great harm in preventive dentistry, says William R. Davis, D.D.S., Director of the Bureau of Mouth Hygiene of the Michigan Department of Health. "This expression is true only for surgical cleanliness, and surgical cleanliness is impossible so far as we know in the mouth of a live person and not very important in a dead one.

"Many teeth that are brushed decay and many teeth that never saw a toothbrush never decay. No dentist on earth can make badly broken down and aching teeth as good as new. Why broadcast such teaching? Educational material that is not true or is out of focus should not be used, no matter how attractive.

"We have led many school boards and teachers to believe that toothbrush drills and cleaning teeth are the whole thing in a dental health program. In certain cases it will help prevent decay. Use of the toothbrush is a good habit, like taking a bath or washing the face. Twice a day, before going to bed and after breakfast, is a reasonable frequency to teach. Why teach five times, which is unreasonable? Why teach using gauze on the finger and boric or salt solution daily to wash the mouth of an infant which is correctly fed and in good health, when clinical experience shows that it does more harm than good?

"The two greatest factors in mouth hygiene are diet and early dental attention. It has been proved quite conclusively that wrong diet promotes decay and correct diet retards decay. If we could have early attention to small defects and correct diet, I believe we could almost wipe tooth troubles off the map even if another toothbrush was never manufactured. This may be rank heresy, but I believe research and clinical evidence are proving it."—From a paper given before the A. C. H. A. and A. P. H. A. Annual Meeting, 1928, by W. R. Davis, D.D.S.

Urologic Conditions Encountered in Children—Neglect of urological examination still being a not uncommon occurrence, this article is of interest and value. It is urged that the same thorough and complete urologic examination and study be made of the child presenting urinary symptoms as of the adult.

Children may be subject to "practically all the various urologic lesions which are encountered in adult life up to the fifth decade, though the symptoms and signs may in many cases be inaccurately described and entirely misleading."

Some pediatricians still hesitate to make a cystoscopic study, but with modern instruments perfected as they are, such examination is perfectly practicable.

In the series presented the youngest patient was 4½ months of age and cystoscopic examination, ureteral catheterization and functional kidney tests

were successfully made. Many patients received light ether anesthesia or nitrous oxide for the few minutes required to examine the bladder and urethra and to catheterize the ureters.

A *preliminary hypodermic injection* of morphine and atropine removes any inhibition of renal function from anesthesia. Cases cited in detail include retention, pyelitis, lithiasis, hydronephrosis, pyonephrosis, tuberculosis, congenital abnormalities and diverticulum of the bladder.

Pyuria and hematuria are noted, particularly as definite indications for early and complete urological study, and emphasis is laid on a belief that "early diagnosis and appropriate surgical treatment will, in most instances, prevent extensive and permanent renal injury."—B. A. Thomas, M.D., and J. C. Birdsall, M.D., *J. A. M. A.*, Nov. 10, 1928.

Training the Child's Emotions—Emotions determine the spice and flavor of life. But emotions, like all other functions of a growing body, must be trained for social living.

Children learn to control and develop their emotions by imitating the behavior about them in their homes, in school, on the playground and in the Sunday school. They respond to influences of their parents, of their reading, of the movies and theaters and of their observation of life.

The binding social force in the emotional life of the child arises from some sense of personal pleasure and satisfaction through accepting the standards of the family and the group to which he belongs. Emotions are related to some simple physical affairs, as, for example, consciousness of one's own size or strength or appearance. The emotional distress of a homely child or of an oversized child in a low grade sometimes beggars description.

The emotions are also bound up with the intellectual life. A high degree of intellectual activity may be a source of comfort and joy, while a limited capacity may give rise to sullenness, irritability and unpleasant school conduct.

The child's emotional reaction toward school is of primary importance. Every child should have some success in school. Even if the success is slight, praise and encouragement should always be given.

The child, however, is more than body and intellect. He is a part of the social world, subject to its laws and regulations. The pressure of social living causes strains within the child and the expression of these strains reveals the emotions that are entering into character. Hence the companionships of children, the mode of treatment by the adults about them, the behavior, the ideas, the sentiments and the practices of the parents profoundly affect the emotional life of the child, which involves his own happiness and that of his family and friends.—Ira S. Wile, M.D., *Hygeia*, Dec., 1928.

A Clinical Study of Enuresis—Any reliable addition to our present slight knowledge of causes and treatment of enuresis is always appreciated. In this study careful clinical analysis of the factors popularly supposed to be accountable for enuresis—relation of diseased tonsils and adenoids. eye strain, phimosis, vaginitis, pyelitis, posture, malnutrition or neurotic constitution—"failed to show their relation to this disease."

Cures, which amounted to about 80 per cent of this series of cases, "were accomplished without regard to any of these factors by measures directed to the bladder itself."

"The term 'enuresis vera' is suggested to indicate that type in which dissociation between the brain and the voluntary nervous system, as concerns the physiology of micturition, actually appears to exist, and the term 'pseudo-enuresis' is reserved for that type of defective control which can be relieved by measures designed to influence the will or to obtain the coöperation of the child."

The only measures found effective in the treatment of "true enuresis" were atropine and massage of the bladder.—Adrien Bleyer, M.D., *Am. J. Dis. Child.*, Nov., 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

REPORT OF THE SUB-COMMITTEE ON NURSING OF COMMITTEE ON ADMINISTRATIVE PRACTICE *

IT seems advisable to go a little into the background of the committee's studies in nursing, in order to arrive at the reason for the present-day need of a sub-committee on nursing. In making the original appraisal form, the National Organization for Public Health Nursing was consulted at every step of the way about the place that nursing should take in organizations. Anne A. Stevens, R.N., who was then the Director of the N. O. P. H. N., gave a great deal of time to this. Nursing groups were apparently satisfied with the advice given and the conclusions reached.

Since that time, it has been nobody's job in particular to keep up to date on the appraisal or to advise in relation to its interpretation or evaluation. One of the reasons for the formation of such committees as ours was a growing feeling on the part of nursing groups that, when studies were made which involved nursing problems, some formal committee should be consulted in relation to conclusions arrived at and the recommendations made.

The N. O. P. H. N. is also making nursing studies and the volume of such studies is steadily increasing. It was considering an advisory committee to consult with its staff on field studies made. Consequently, with two groups making studies in the field the time seemed ripe to have a committee of each, which should function separately in relation to each group and jointly in regard to the relation of one group to another.

Naturally common problems would arise in relation to the scope of each group making studies; the kind of information to be gathered; the schedules for gathering such information; the evaluation of such studies; the conclusions and recommendations arrived at; and the coördination of one group to another.

The N. O. P. H. N. appointed a committee which is synonymous with our A. P. H. A. committee on nursing with one exception—the Director of the N. O. P. H. N. is a member of the A. P. H. A. committee, but is naturally not on the N. O. P. H. N. committee.

FUNCTION OF THE COMMITTEE

The function of a committee such as ours might be:

To assist in keeping the appraisal up to date

To assist in evaluating nursing services in relation to changing needs

To keep the field staff advised regarding general nursing trends and policies

To advise in relation to the extension of studies in nursing

To assist in working out some method of ascertaining qualitative as well as quantitative practice

To advise in relation to making specific studies

To be the medium of problems in relationship to the N. O. P. H. N.

To work out plans for coöperation and coördination with the N. O. P. H. N. in their nursing studies

Eventually, it is hoped that we may be able to work out some more definite

* Presented to the Committee on Administrative Practice of the American Public Health Association in New York, N. Y., May 24, 1928.

conclusions in regard to certain nursing practices and policies.

The committee has had one meeting as a whole with Dr. Walker, at which we discussed and reviewed the potentialities of the committee.

Dr. Walker met with the Advisory Committee of Field Studies of the N. O. P. H. N., at which meeting we reviewed their schedules for studies and also discussed some of the common problems, such as the extent of information it was advisable for the N. O. P. H. N. to give; the need of both the A. P. H. A. and the N. O. P. H. N. being in accord with relation to certain recommendations which they might make in relation to nursing studies.

SOPHIE C. NELSON, R.N., *Chairman*
MARY LAIRD, R.N.
AMELIA GRANT, R.N.
JANE C. ALLEN, R.N.

Annual Reports—"Annual reports can be roughly classified as surveys or obituaries," says the *Health News*. The better kind tells what has been accomplished and how this was done, and compares results so that contrasts between poorly done and well done health work show up clearly.

"In one sense an annual report should be like the record of a periodic health examination—designed to show up defects and to point out methods of prevention and cure."—*Health News*, New York State Dept. of Health, V: 47 (Nov. 19), 1928.

California Provides for Crippled Children—The Crippled Child Act of the 1927 legislature has been in operation less than a year. Due largely to the efforts of the California Society for Crippled Children, legislation was secured. It proved to be a timely measure, for an acute epidemic of poliomyelitis was more widely spread throughout the state in 1927 than ever before in history. While the Act has provided for all handicapped children, it is the sufferers from infantile paralysis who have benefitted from the provisions outlined in this Act.

The plan under which the law operates is outlined briefly in an article entitled "The Care of Crippled Children," in the November issue of *The Pacific Coast Journal of Nursing*.

Needy, physically defective or handicapped persons under eighteen years of age and residents of California who should have necessary surgical, medical, hospital, physiotherapy, occupational therapy or other service, special treatment, materials or appliances for use in relieving their defective or handicapped condition, may now obtain any or all of these at County expense under the provisions of the so-called "Crippled Child Act" of the 1927 legislature. Treatment is provided only for handicapped individuals, whose parents or guardians are unable to provide necessary treatment either wholly or in part.

It is the duty of the State Department of Public Health to furnish the necessary treatment and services upon presentation of a certificate from the parent or guardian stating that he is unable to furnish care.

The state does not bear the expense of the treatment, for all money expended under the authority of this certificate constitutes a legal charge against the county from which the certificate is issued.

Hospitals are opened to these patients and have local public diagnostic clinics. Health workers are generally informed regarding the times and places at which clinics and conferences are held.

A strict supervision over all cases under its care is maintained by the State Department of Public Health and, for this reason, a supervisor has been appointed. Visits are made and records are kept, so that improvements may be noted as they occur.

The State Department of Public Health is enabled by law to enter into agreements with parents and guardians to pay such amounts as they may be

able toward the cost of service, equipment and its transportation.

The law further empowers the State Department of Public Health to receive gifts, legacies and bequests to expend for the purposes outlined in the Act, provided no part of such funds shall be used for administrative purposes.

Counties are authorized to provide treatment independently for these cases or they may coöperate with the State Department of Public Health. A tremendous amount of good has been accomplished for the children of California as a result of the application of this law.

NOTE: According to reports, the Act in its present form is not entirely satisfactory. This is due, in part, to the number of patients requiring surgical treatment and also to the prolonged nature of the illness. Few counties could finance the program. It has been suggested that the expense be borne jointly by the county, state, service clubs, local welfare organizations and parents and guardians.

The matter of treatment of these cases brings up the problem of both scholastic and occupational education. The need for convalescent homes conveniently located and planned with an idea of giving necessary scientific treatment is already being demonstrated.

Until the program can be carried out along these constructive lines, full benefit will not be derived from the new law.—

Crippled Child Act, *Pacific Coast J. Nurs.*, Nov., 1928.

Permanent Responsibility versus Temporary—"What the Future Holds for Public Health Nursing under the American Red Cross" is discussed by Elizabeth G. Fox, R.N., in a recent pamphlet of that name. The first decade of the post-war nursing service is ending, and in the light of these past ten years Miss Fox raises the questions: "Where are we? Where do we want to be? How do we get there?"

The Red Cross is wholly or in part responsible for 568 public health nursing services, and is the largest single employer of rural nurses in the country. The rural field, however, is far from adequately covered; there is still great need for strong central promotion, guidance and support, such as the Red Cross, from its hard won experience, is well equipped to give.

Because of this, Miss Fox feels that the Red Cross should cease to consider its function as that of demonstrating public health nursing, and should adopt instead "an ideal of permanent responsibility for public health nursing in the community, and a policy of perpetuating partnership with public authorities."

This may be done by equal contribution of funds on the part of the chapter and the public agency, or by the official agency carrying the greater part of the expense while the chapter assumes the responsibility of administration. The Red Cross has much to contribute in experience, maintenance of standards, community interest and good will, as well as offering constructive program planning over a period of time, despite political upsets or changes of health officials.

With this ideal of long time responsibility on the part of the Red Cross for public health nursing activities, Miss Fox goes on to discuss problems which chapters will meet and lines along which they may well develop, touching on the need for nursing care of maternity and sick patients, prenatal supervision, the needs in counties of large area and small population, etc. Her conclusion shows the present position of the Red Cross Public Health Nursing Service:

It is ready now for its maturity; ready to put its hard-won experience to use in developing its services in accordance with growing demands and advancing standards; in pushing out experimentally into difficult fields; in seeking ways appropriate to the small town and village; of developing community nursing on a scale comparable with that in the cities.

L. A. D.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

The Big Idea for Minneapolis—The Cincinnati meeting of the Public Health Education Section was notable for the initial presentation of the diphtheria campaign. Chicago will be long remembered by many because of the two consecutive sessions on program planning. Before this paragraph is published the Section Council will have had a meeting to plan for Minneapolis, but an eager welcome is assured any suggestions for the "big idea" and for lesser ideas for the 1929 program of the Section. Address the chairman, Ira V. Hiscock, Yale University, New Haven, Conn.

Wherever There are Two or More—In any community or convention where there are as many as two people interested in some phase of health education-publicity there is the material for a get-together, formal or informal. From some of those who have been testing the idea comes the testimony that it is quite worth while simply to get together at luncheon now and then and chat over methods and problems. Merely "talking things over" may help a lot. The editor would like to hear of any groups getting together in any fashion.

Cross Word Puzzles—Questions and Answers—The Annual Directory of Newspaper Syndicates (*Editor and Publisher,* Aug. 25, 1928) lists 11 different syndicates selling cross word puzzles to newspapers. This fact and the very interesting "Do You Know" series appearing every Sunday in the *New York World* emphasize anew that these forms of publicity-education are by no means worn out. But when we adapt them to health and other social work they need to be well done.

Publicity Awards in June, 1929—Modest awards carrying great honors will be made for the best in news photographs, annual reports, radio talks, posters, feature stories, and Sunday magazine stories of 1928–1929. The awards will be made at San Francisco in June, 1929, by the Committee on Publicity Methods. A number of the 1928 awards were made to readers of this department.

A Popular Reference Book for Public Use—Make up a scrap-book or loose-leaf binder covering the patent medicines and undesirable remedies sold, advertised or known to be popular in your community. Get material from American Medical Association and other thoroughly reliable sources, securing two copies where material is on both sides of the sheet. Start each remedy at top of page and arrange in a b c order. When you announce the new book invite suggestions of remedies to include. Place on a shelf, with a big sign, where it can be consulted without asking for it. Tuberculosis societies and others might try this on their specialties. Something to be mentioned from time to time; usefulness not limited to the number actually consulting it. A committee of women might do the work of clipping and arranging the material. (Yes, this is a good idea. Let the scrap-book con-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

sist of newspaper clippings of patent medicine ads, with brief typewritten exposé under each. *Nostrums and Quackery*, published by the American Medical Association, will give information on many of them. Some years ago I prepared such a scrap-book for the Better Business Commission of Toledo with good result. A scrap-book might also be sent to newspaper editors, but be very tactful about it.—H. E. K.)

EXHIBITS

An exhibit of the Delaware County Tuberculosis Association: A wall map 4 by 5 feet, black and white outline with heavy lines for township and county boundaries. The 140 deaths, 1927, were indicated by

. . . 6 volt flashlight bulbs which are, I think, much more durable and take up less space than the bulbs that are commonly used in decoration. A transformer cuts the voltage down from 110 to 6. Bulbs representing deaths of negroes have been dipped in green Franco Print Lamp coloring. The bulbs representing deaths of white people we are allowing to remain white. Our first thought was to color these red but since we want to use the map in daylight as well as at night, we were afraid that the red lights would be too dim to attract much attention.—

Charles Kurtzhalz

STUNTS

And while we're on the subject of putting out fires, it occurs to us that the fire wagons and fire houses in every town and city in Indiana are the most important cynosures at least when some place is on fire. Why not ask the fire chief to carry a banner on the side of the fire wagons during December, where it'll make big publicity when there's a fire. The banner might say: "Put Out the Tuberculosis Fire with Christmas Seals!" And on the top of your traffic semaphores a great big Seal Sale sign could be implanted, urging those who pass the corners to "Drive Safely—Buy Christmas Seals!"—

Indiana Tuberculosis Association

The ship on the 1928 Christmas seal inspired a whole new line of stunts and more or less dramatic presentations of health and tuberculosis ideas. Mrs. W. H. Griffith, Sioux City, Ia., prepared several features in which music, readings, or dialogue provided new settings for old truths. All this emphasizes the possibilities in varying the form in which health facts and ideas may be offered and new angles of interest may be developed. History, news, personalities and other elements may be drawn upon for settings for health messages.

CLASSES

The most extensive course in health education-publicity yet available is that announced by the National Tuberculosis Association and Columbia University for January 14–26, which is open only to workers who have had some definite training or experience in publicity. Address the University, or Philip P. Jacobs, the conductor, National Tuberculosis Association, 370 Seventh Ave., New York, N. Y.

Also address Mr. Jacobs regarding the tuberculosis institutes, which include education-publicity sessions, to be held in Philadelphia, Pa. February 25–March 9), Columbus, O. (April 8–20), Minneapolis, Minn. (June 17–29), and probably Nashville, Tenn.

An evening course in educational publicity will be conducted (January 2–March 23) by the New York School of Social Work, intended primarily for executives and those doing publicity work. This, and the regular spring term course (March 25–June 15), will be conducted by Mr. and Mrs. Routzahn. Both of these courses call for much real work by the students.

TIMELY TOPICS

Colds, temperature, ventilation—an opportunity for very practical suggestions. The big task is to learn how to be convincing—how to get action! Most of our readers or hearers will agree to all that we offer—but will they adopt the suggestions?

One effort to "get under the skin" of the indifferent is the Syracuse "No-Cold Club." The "membership application and pledge" reads:

I want to be a Reg'lar Feller! Therefore, I solemnly promise to do my best to avoid colds, and will follow the By-Laws and rules of the No-Cold Club. I will also try to protect others from colds, and will tell others about the Club.

An illustrated 4-page folder gives the constitution and by-laws which bring out the anti-cold propaganda in unusual fashion. *It is not copyrighted.* Be sure to ask the Health Department or other health agency in Syracuse, N. Y., for a copy. The folder costs about $4.75 per 1,000 in 10,000 lots.

DATES AHEAD

Parents' Exposition, Grand Central Palace, New York, N. Y., February 23–March 2, 1929. Address: Parents' Exposition, 152 West 42d Street, New York, N. Y.

National Negro Health Week, March 31–April 7, 1929. Address: U. S. Public Health Service, Washington, D. C., or National Negro Health Week Committee, Tuskegee Institute, Ala. An opportunity for tuberculosis and other health agencies to serve as secretary or executive of state or local celebrations.

COÖPERATING GROUPS

Every community of any size contains numerous groups open to suggestions as to topics for papers, debates, discussions, reports and other forms of presentation. Boys' clubs, settlement clubs, school societies, debating clubs, men's Bible classes, church societies, and numerous others have programs of one type or another which should appeal to the ingenious health worker—not to offer speakers but to suggest ideas by which health material may be brought into their regular programs by their own members. College debating teams should not be out of our reach, and graduation essays are an easy possibility. Inter-settlement debates, speeches, etc., could be tried. *What have we done in any of these directions?* State and national health bodies might well tackle this job.

The revised Manual for Chapters (American Red Cross, Washington, D. C.) includes chapters on First Aid, Life Saving, Public Health Nursing, Home Hygiene and Care of the Sick, and Nutrition Service.

PUBLICITY DICTIONARY

Propaganda: "And publicity is propaganda, since it leads people who might be thinking of anything else in the world to concentrate on this one special thing for the moment."—Harrison Smith in "Do Book Reviews Sell Books?" *Atlantic Bookshelf,* May, 1928.

OFFICE

Ask *The Nation,* 20 Vesey St., New York, N. Y., for a copy of the green, hand-lettered renewal blank headed "Your subscription expires next month." Illustrates the distinctiveness of hand lettering—and colored paper—for small pieces of printed matter.

"Dictated but not read" still appears at the bottom of some letters. Such a letter says: "Here, old thing, is something I dashed off. It may not mean what it says, but it is up to you to decide what it does mean. It is not my responsibility." Why not return the letter with the endorsement "Received but not read"?

If you must write "Personal" or any other admonition to the one who opens mail it should be placed immediately above the address if you truly wish it to receive attention. My observation is that those who open mail do not look at the bottom of the envelope for special instructions.

But don't risk "Personal" unless it is personal. Writing on "Personal and Private" in *Printer's Ink* (Aug. 23,

1928), Amos Bradbury emphasizes "a growing practice among advertisers which is doing far more harm than good." The writer makes particular reference to the unfortunate use of "personal" on letters appealing for contributions.

The Milbank Memorial Fund, 29 Wall St., New York, N. Y., uses an effective printed address label for large envelopes and packages.

"The Vertifile" looks good for keeping cuts or plates from being scratched or lost. Harlo R. Grant and Co., 2322 West Madison St., Chicago, Ill.

To secure examples of how form letters, without individual addresses filled in, can be made effective in different sizes and shapes, ask for information and get on the mailing list by addressing Encyclopedia Britannica, 342 Madison Ave., New York, N. Y.

When you fail to get a reply to your letter asking for information or advice the simplest follow-up is a fresh copy of the original letter. This usually works, but sometimes a third or even a fourth copy needs to be sent when you are anxious for a reply. Letters do get lost in the mail—or in the office. And there may be good reasons for not getting off quickly a reply to your request. But to write and request a reply to your letter of a certain date may not help much. Suppose it was never received or has been mislaid!

CAMPAIGNS—SPECIAL DAYS

Early Diagnosis Campaign conducted by tuberculosis and other health agencies in March. Address any state tuberculosis association. The list of supplies, 23 items, includes folders, small pamphlets, 24-sheet billboard poster, smaller posters and cards, car cards, high school poster, gummed posterette, window display, lantern slides, strip film, motion pictures, electrotypes.

The Syracuse "No-Cold Club" is a feature of a campaign in which for newspaper publicity the Onondaga Health Association, Syracuse, N. Y., is enrolling the mayor, sorority girls, Rotarians, and other personalities, with quotations, interviews and radio talks.

A three-year campaign to secure "100 per cent sanitation" is under way in Virginia. Prizes are to be offered to the associations that secure the most improvements during the campaign. The slogan is "Virginia, the first state sanitated." A report of present conditions shows for each county the approximate number of homes, the percentage with proper sewage disposal, percentage with safe water supply and with adequate fly control. Rules of the contest and other helps are available through the State Department of Health.

NEWSPAPERS

"Of the news articles which yielded probably the largest number of clippings was one beginning 'A rheumatic twinge may not prophesy stormy weather,' declares Dr. Merrill M. Myers, president of the Iowa Heart Association, 'but . . .'"—*Annual Report of Iowa Tuberculosis Assn.*

That syndicates are selling 17 different daily or weekly health columns to the newspapers of the United States and Canada was revealed in Annual Directory of Features in *Editor and Publisher,* Times Bldg., New York, N. Y., Aug. 25. 90 cents. Eighty-three syndicates now offer nearly 2,000 different features to the newspapers, including 11 series of crossword puzzles!

The syndicated health columns are written by Dr. John Joseph Gaines, Dr. Logan Glendenning, Dr. Morris Fishbein, Dr. Herman N. Bundesen, Dr. Frank McCory, Dr. William Brady, Gorgas Memorial, Dr. Lulu Hunt Peters, Dinah Day, Jessie Knox, Dr. W. A. Evans, Dr. J. A. Jackson, Dr. J. W. Barton, and Paul J. Veatch.

BOOKS AND REPORTS

Public Health and Hygiene—*Edited by William Hallock Park, M.D. (2d ed. rev.) Philadelphia: Lea & Febiger,* 1928. 902 pp. Price, $9.00.

In the eight years which have elapsed since the publication of the first edition of this book, much has been added to our knowledge of public health, so that a second edition was most desirable. The present volume shows evidence of rewriting as well as careful revision.

Twenty-four authors have contributed to the present volume. The deaths of two of the original contributors, and the withdrawal of others, have made certain changes necessary. Additional chapters have been added on the control of cancer and the proper handling of patients suffering from contagious diseases, in order to prevent cross infections. Seven important subjects are treated by new writers.

There is little to criticise in the book. The individual chapters are complete in themselves and of high quality. The facts are not only correctly given, but the presentation is clear and understandable, an especially desirable feature, since the book is intended not for specialists in public health, but for physicians generally, and even students.

Because of advances which have been made during the past few years in our knowledge of foods, probably the most interesting chapters are those treating of this subject, and especially those on milk. In view of the increased use of dried milk, we wish that more than nine lines had been devoted to its consideration.

Some rearrangement is advisable, since septic sore throat, conjunctivitis, trachoma, tetanus, leprosy and mumps are included under infectious diseases of the respiratory tract. There may be some reason for placing leprosy and mumps in this category, as our knowledge concerning them is very incomplete, but certainly the others do not belong there.

The book is a distinct addition to one's library. The printing and make-up are exceptionally good.

M. P. RAVENEL

The Determination of Hydrogen Ions—*By W. Mansfield Clark, Ph.D. (3d ed.) Baltimore: Williams & Wilkins,* 1928. 717 pp. Price, $6.50.

The third edition of this work, which has become almost classic, especially in biological fields, is 50 per cent larger than the second edition and more than double the size of the first edition, though it has not become unwieldy. The increase in size is not due to haphazard additions. More than one part of the second edition has been critically curtailed in the revision, e.g. the bibliography has been cut from over 110 pages to about 80, covering the same range but with a more critical selection of titles.

A somewhat greater air of chemical sophistication appears in this edition due to the author's concept, in this revision, that it "is the function of this book to tell *about* a few of the more important matters in terms agreeing essentially with those which the reader will have to know in his study of the literature." Formal definitions of many such terms are made available in the appendix.

The author has succeeded, despite enough added material more than to justify the publishers' claims of "much new material and many new graphs," in keeping intact not only the general

structure of the book, with slight alterations in chapter order and numbering, but also the "more or less discoursive style," which has made each of the editions so readable.

The more obvious of the new material consists of: Chapter VII on The Application of Spectrophotometry, Colorimetry, etc.; Chapter XI on Changes of Free Energy; Chapter XVIII on Oxidation-reduction Potentials replacing the chapter on the Relation of the Hydrogen Electrode Potentials to Reduction Potentials; Chapters XIX and XX on a series of oxidation-reduction electrodes, the glass electrode, the oxygen electrode, etc.; Chapter XXII on Temperature Coefficients; Chapter XXV on The Theory of Debye and Hückel; Chapter XXVII on An Alternative Method of Formulating Acid-base Equilibria; and Chapters XXVIII and XXIX on Elementary Theory of Titration and Non-aqueous Solutions respectively.

These added chapters by no means exhaust the "new material." The older chapters have been very largely rewritten and much new matter incorporated, and the appendix, which has been greatly amplified, contains a fund of information.

The book can be recommended not only as a guide in matters of technic, but also as a store of subtle suggestion and an abundant source of information.

ALLEN E. STEARN

The Intelligent Woman's Guide to Socialism and Capitalism—*By Bernard Shaw. New York: Brentano's, 1928.* 495 pp. Price, $3.00.

The crafty pen of George Bernard Shaw will again give rise to dilatations upon the topics discussed, which, however, will soon lapse, because of the lack of adequate examples and statistics supporting most of his arguments concerning the seven proposed plans for the distribution of the country's income.

The book smacks a little of careful pigeonholing of past observations in order to revile effectively Capitalism as a background, in sharp contrast to Socialism painted in relief. It reminds one of the common fallacious belief that "If a small amount of medicine is good, an increased amount will be better." One misses the appreciation of the infinite varieties necessary not only for the "whole," but likewise the need of contrast for the individual. Consideration of the probable mode of transition from Capitalism to Socialism would add greatly to the value of the book. However, the author may claim that since the analysis has not been based on clean dissection, it should serve merely as provocative of thought, not decision. Too many statements take for granted the frequently absent capabilities and sense of proportion and values in individuals. The book is typically Shavian, stimulating to thinking and discussion.

M. P. RAVENEL

Physiology and Human Life—*By Robert A. Budington. Based on Advanced Physiology and Hygiene by Herbert A. Con and Robert A. Budington. New York: Silver, Burdett & Co., 1928.* 395 pp. (195 figs.) Price, $1.56.

This is a revision of an earlier widely used school text, bringing it up to date in the important fields of the endocrines, the rôle of the vitamins, and the effects of light upon tissues directly and upon metabolism. It also incorporates important advances in the knowledge and control of diseases made in recent years. The text has been entirely rewritten with emphasis upon the clearly established and well confirmed phases of these sciences. Each of the 22 chapters is supplemented by a list of readings in standard works and a list of questions designed to stimulate interest in the relations of the subject matter to the physiological facts of everyday life

and to disease in relation both to the individual and to public health. While the book is an admirable one with reference to its use in the discipline of education in scientific lines, it also has high value in inculcating in the reader an appreciation of the value of an intelligent and reasoned pursuit of good health. All public health workers will find in it a valuable work of reference for elementary use and an inspiring treatise in its point of view and purpose.

C. A. KOFOID

Social Work and the Training of Social Workers—*By Sydnor H. Walker. Chapel Hill, N. C.: University of North Carolina, 1928.* 238 pp. Price, $2.00.

The University of North Carolina Press has already issued a score of Social Studies ranging in price from $1.00 to $5.00, all of which should be in every social worker's library.

"No field of modern social concern," says the jacket of the present volume, "needs clear analysis or critical study more than social work. . . . Since Miss Walker is not a social worker and never has been one, her study happily lacks any semblance of special pleading and avoids narrowness—that occupational disease of the specialist."

If this were a column instead of a review, it might be amusing to consider whether the word "happily" should have been omitted in the quotation; and to discuss whether not being a social worker is really a guarantee against narrowness and the semblance of special pleading in a book which deals with social work and training for it.

However, this book is relatively free from such defects; and is the more readable because it seems to be written in the language of a student of education and economics with few of those special turns of thought and language which are so familiar in the conference papers, the periodicals and the textbooks of social work.

After preliminary chapters discussing the backgrounds, the characteristics and motives, and the objectives, of social work and the sources of its financial support, the author comes closer to her task in trying to discover what are really its characteristic activities and to interpret its claims. The eighth and ninth chapters set forth the educational needs of social workers, contrasting the prevalent apprenticeship with the specialized education now admitted to be essential, and then briefly but fairly describe the present professional schools and their courses. In the closing chapter Miss Walker discusses the very unsatisfactory existing relation between social work and the social sciences.

There are an extensive classified bibliography of over 30 pages and a directory of more than 50 periodicals in the field of social welfare and applied social science. EDWARD T. DEVINE

The Healers—*By B. Liber. New York: Rational Living, 1928.* 454 pp. Price, $3.00.

The healer who reads B. Liber's book will not find much comfort for his shortcomings whether he be regular or cultist. It might not do healers any harm to read the book; and health workers may well expect to profit by trying to understand the point of view of this biographical presentation of the trials and tribulations of an individual who, in attaining his medical degree, was not moulded into a standard product.

Paper, printing and literary style do not contribute to make the book easy or pleasant reading. Though it might be profitable reading for "healers," it is difficult to understand the place of such a book in general health literature.

ALEC N. THOMSON

Hunger Fighters—*By Paul de Kruif. New York: Harcourt, Brace, 1928.* 370 pp. Price, $3.00.

If the author of that interesting and successful book, *Microbe Hunters,* were contributing this review, he would probably say something like this: "The writer of that popular book, *Microbe Hunters,* has burst forth again to haul a bunch of bum scientists out of obscurity and tell the world their stuff in his customary and effusive style." And, despite a somewhat flatulent manner, he has told it, told it in 11 romantic short stories that hold the reader's interest from start to finish, even though there are times when the reader is forced to suspect that the romance runs away with the facts.

At the beginning of this engrossing volume the reader is given to understand that all of these heroes were completely forgotten until de Kruif honored them with his attention. This may be true of a few of his subjects, such as Carleton, the "wheat dreamer"; and it may be that the general public has never heard much about some of these workers, mostly governmental scientists; but certainly Mohler and Dorset, Babcock and Steenbock, Francis and Goldberger are well and favorably known in agricultural, public health, and general scientific circles. As a result of this book they will receive due recognition of their achievements.

Public health is indeed well represented in this group of stories about men who have contributed to human welfare, particularly in matters allied to food production. There are tales of the remarkable work on tularemia by Francis, the conquest of pellagra by Goldberger, the discovery of the principle of irradiation of foods by Steenbock, the development of genetic facts by Shull, the onslaught on hog cholera by Dorset, and the control of foot and mouth disease by Mohler. He has written a captivating book of narratives, as well worth perusal as those in *Microbe Hunters.*

The book is exceptionally well printed, with type that ought to delight the National Society for the Prevention of Blindness. It is competently illustrated by "Zadig." Read it by all means, for it is a fascinating volume.

JAMES A. TOBEY

Goiter Prevention and Thyroid Protection—*By Israel Bram, M.D. Philadelphia: F. A. Davis,* 1928. 327 pp. Price, $3.50.

The author discusses a subject of growing importance. The book has been written chiefly for the layman, though it is expected to be useful for the medical man as well. It is probable that more than 7 million people suffer from goiter in this country, in addition to which, Graves' disease, which the author considers a constitutional condition, influenced by the prevalent unrest and excitement of the general mode of living in this country, is taking an increasing toll of victims. Altogether, he considers that the thyroid gland is "more sinned against than sinning."

There is a good description of the thyroid, its functions in health, and the results of disturbed function. The chapter on endemic goiter is contributed by Dr. Olesen of the U. S. Public Health Service, and discusses its prevention by the use of iodine. The views of Dr. McCarrison on the relationship of iodine to goiter are also given, and we are warned against the promiscuous use of iodine and obesity cures, most of which contain thyroid extract. Especially dangerous is the taking of iodine in the exophthalmic form of the disease. There is a chapter on diet, which the author believes has a strong bearing on the structure and function of the thyroid gland.

While the book considers treatment, the author states that this is the busi-

ness of the physician, and those who feel that they are overweight should consult a physician before undertaking measures for reduction. Great stress is laid on relaxing and recreating forces, the chief of which he considers ". . . a healthy religion, sleep, music and laughter."

An appendix gives a brief description of the various ductless glands of the body and some history of our knowledge of endocrinology.

The material given is mostly sound, and there is much useful advice, though we believe that the endeavor to make a book for both the physician and the patient is a mistake.

The book is well printed and illustrated. M. P. RAVENEL

Physiology and Biochemistry of Bacteria. Vol. I—*By R. E. Buchanan and Ellis I. Fulmer. Baltimore: Williams & Wilkins, 1928.* 516 pp. Price, $7.50.

Progress in a science can often be best served by pausing to evaluate the disclosures of the past. Not only can the advances in the understanding of a specific subject be revealed by such a procedure, but a mere recounting of past discoveries serves to point the way to further advances and guards against following more or less seductive courses of action founded upon false premises. For a science presenting the phenomenal development of bacteriology such a pause for consideration of the validity of fundamental concepts is imperative, for, unless the facts keep within measurable distance of theory, the errors of the past become cumulative and fallacy will but lead to greater fallacy. It is gradually becoming evident that bacterial activity is not a thing wholly different and apart from other biological activities; that it is directed by and can only be explained by those laws recognized by the chemist and the physicist as governing biological phenomena in general.

Recognizing these things the authors of *Physiology and Biochemistry of Bacteria* have attempted to collect and evaluate the available information concerning the more fundamental properties of bacteria and the principles governing bacterial action. This they have done in admirable fashion, presenting a text that is worthy of the attention of all who are concerned with a study of any phase of bacteriology.

To record the sub-title of the book—Growth Phases, Composition and Biophysical Chemistry of Bacteria and their Environment, Energetics—states in the briefest possible way the content, but does not adequately express the diversity of the information presented. The enormous amount of work which has been done upon these basic subjects is impressive, and here, for the first time, may be found collected and interpreted those facts which future work in bacteriology must recognize. The recurring statement that more work should be done cannot fail to furnish the incentive for study in many directions, and serves to point out how incomplete our knowledge of many important phases of bacteriology is at present. Aside from its interest as an effort to deal with the more intimate phases of bacterial activity the text is readable and has great value as a reference book. The sub-title designates the book as Volume I. For the sake of bacteriology and bacteriologists it is to be hoped that other volumes will be forthcoming. GEORGE H. SMITH

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Tuberculosis Susceptibility and Humidity—High temperature and humidity did not alter the susceptibility and resistance of guinea pigs to tuberculosis.

BAETJER, A. M., and LANGE, L. B. The Effect of High Humidity and Moderately High Temperature on the Susceptibility and Resistance to Tuberculosis in Guinea Pigs. Am. J. Hyg. 8, 6: 935 (Nov.), 1928.

Venereal Disease Control—A general review of venereal disease control practice summarizing the work of one Canadian clinic.

BATES, G. The Venereal Disease Clinic. Pub. Health J. (Canada) 19, 10: 466 (Oct.), 1928.

Recognition of Juvenile Tuberculosis—A review of 300 preventorium cases which emphasizes the indefiniteness of physical signs and the importance of history. The need for preventoria for the observation of children is stressed.

BRONFIN, I. D. The Preventorium Child. Am. J. Dis. Child. 36, 5: 931 (Nov.), 1928.

More about Rheumatism—A symposium on rheumatism by foreign authors. The British medical press has been full of similar articles. The present series has the virtue of bringing the same material within easy reach of American readers.

CLARKE, J. T., et al. Symposium on Rheumatism. M. J. & Record 128, 9: 457 (Nov. 7), 1928.

Diphtheria Control—The difficulties of eradicating diphtheria in institutions by means of carrier finding procedures are stressed. Immunization with toxoid was found most effective in the naval school reported upon.

DUDLEY, S. F. The Control of Diphtheria in Crowded Institutions. Pub. Health (London) 42, 2: 1927 (Nov.), 1928.

Health Examinations and Cancer—The value of the periodic health audit is discussed and its particular importance in the detection of cancer is stressed.

FAUGHT, F. A. Health Examinations as a Means of Diagnosis in Cancer Control. M. J. & Record 128, 10: 515 (Nov. 21), 1928.

Skyshine and Rickets—White rats on a vitamin D deficient diet exposed to a north light behind Vitaglass had normal calcification of the bones whereas those behind ordinary glass developed marked rickets. Evidently skyshine provides ample antirachitic factor and direct sunlight an excess.

FLEMING, W. D. The Antirachitic Efficiency of Skyshine in Washington, D. C. Mil. Surgeon 63, 5: 658 (Nov.), 1928.

Child Care by Physicians—A summary of the points in child nurture with which the practicing physician should be familiar in order to guide the mother adequately. An excellent presentation.

GOLDBLOOM, A. The Rôle of the Physician in the Rearing of Children. New York State J. Med. 28, 21: 1274 (Nov. 1), 1928.

Phenol Soaps—Experiments are reported showing inhibitory action of soaps on phenol, indicating the uselessness of the latter in the production of germicidal soaps.

HAMPIL, B. The Effect of Pure Soaps on the Bactericidal Properties of Phenolic Germicides. J. Bact. 16, 5: 287 (Nov.), 1928.

Post-Sanatorium Care—How tuberculosis convalescents are brought back to productive life in a special work shop

is the story of this successful pioneering enterprise.

HOCHHAUSER, E. The Story of the Altro Work Shops. New England J. Med. 199, 19: 915 (Nov. 8), 1928.

Prenatal Hoarding of Antirachitic Vitamin—To test the validity of the assumption that the antirachitic factor is stored in the liver before birth, the potency of the factor in livers of premature and full-term infants was determined. No difference was found, which indicates that the predisposition of premature infants to the disease does not depend upon prenatal hoarding.

HESS, A. F., and WEINSTOCK, M. An Investigation of the Prenatal Factor in the Susceptibility of Infants to Rickets. Am. J. Dis. Child. 36, 5: 966 (Nov.), 1928.

Rickets Preventives—Cod liver oil in 5 mg. doses gives better protection to white rats against rickets than ultraviolet irradiation. Larger amounts of oil afforded no greater protection.

HOLMES, A. D., *et al.* A Comparison of Cod Liver Oil and Ultraviolet Light for Use in the Prevention of Rickets. Am. J. Dis. Child. 36, 5: 952 (Nov.), 1928.

Employment of the Tuberculous—A report on a successful experiment in medically supervised employment for 676 patients recovering from tuberculosis.

KLEIN, A. C., and THORBURN, G. Employment of the Tuberculous. N. Y. Tuberc. & Health Assn. Publication (Nov.), 1928.

Prevention of Human Rabies—Two deaths from rabies are reported in which the patients were bitten on the lip by known rabid dogs. Local treatment and Pasteur treatment (begun 3 and 4 days later) failed to prevent the disease. Immediate Pasteur treatment and cauterization with fuming nitric acid is urged.

RICE, T. B. Two Human Cases of Rabies. J. A. M. A. 91, 21: 1631 (Nov. 24), 1928.

Tuberculosis and Public Health—This Herman M. Biggs Memorial Lecture is a masterful and detailed presentation of the whole subject of health promotion and disease prevention. Too inclusive for summarization here.

KRAUSE, A. K. Tuberculosis and Public Health. Am. Rev. Tuberc., 18, 8: 271 (Sept.), 1928.

Health Work in Flood Area—Federal, State and non-official health agencies united to create in the Mississippi flood area 86 full-time county health units. A lasting blessing growing out of a great disaster.

LEACH, C. N. Progress of Health Work in the Mississippi Flood Area. J. A. M. A. 91, 21: 1595 (Nov. 24), 1928.

Per Capita Milk Consumption—A thorough house-to-house canvass of 18 southern communities revealed a higher per capita milk consumption among the whites than in the larger cities in the country. In these communities the daily consumption was 1.23 pints per capita.

LEACH, C. N., and FRANK, L. C. Milk Consumption in Eighteen Small Alabama Communities. Pub. Health Rep. 43, 45: 2955 (Nov. 18), 1928.

Maternal Mortality—A plea for better obstetrical practice by the family physician who makes 80 per cent of all deliveries. If lower maternal death rates are not secured in this way, State intervention threatens.

LITZENBERG, J. C. Obstetrics and Gynecology in Public Health Program. J. A. M. A. 91, 21: 1587 (Nov. 24), 1928

Prevalence of Venereal Diseases—A state-wide survey of cases of venereal disease under medical supervision made by the New York State Department of Health showed a prevalence rate of 4.57 per thousand. Many other interesting facts were revealed by the study.

PFEIFFER, A., and CUMMINGS, H. W. The Prevalence of Syphilis and Gonorrhea. New York State J. Med. 28, 19: 1147 (Oct. 1), 1928.

Etiology of Poliomyelitis—Streptococci recovered from the spinal fluid of fatal cases of poliomyelitis and experimentally inoculated monkeys were agglutinated specifically with hyperimmune poliomyelitis antistreptococcus serum.

ROSENAU, E. C. Streptococci in the Spinal Fluid in Acute Epidemic Poliomyelitis. J. A. M. A. 91, 21: 1595 (Nov. 24), 1928.

Carrier Infected Food—This is a report of an epidemiologic study of a typhoid fever outbreak found to be due to the consumption of corned beef infected by a carrier who prepared the meat for a church supper.

SCAMMAN, C. L., and FORSBECK, F. C. An Outbreak of Typhoid Fever Traced to Corned Beef Infected by a Carrier. New England J. Med. 199, 14: 664 (Oct. 4), 1928.

Scarlet Fever Prevention—The therapeutic and prophylactic use of anti-scarlet fever serum is questioned, but the use of toxin for immunization was successful in this author's experience.

TOOMEY, J. A. Treatment and Prevention of Scarlet Fever by Specific Antitoxins. J. A. M. A. 91, 21: 1599 (Nov. 24), 1928.

Biology of Senescence—The evolution and involution of human life is discussed in detail at the opening of Graduate Fortnight of the New York Academy of Medicine. A well drawn picture of the biology of life.

WARTHIN, A. S. The Pathology of the Aging Process. New York State J. Med. 28, 22: 1349 (Nov. 15), 1928.

Posters for Diabetics—Not only what to eat, but how to live, are the questions answered by this series of posters used to instruct diabetic patients.

WILLIAMS, J. R., and VYE, M. The Use of Posters as a Means of Instruction in a Diabetic Clinic. J. Lab. & Clin. Med., 14, 1: 57 (Oct.), 1928.

The National Tuberculosis Program—The program of the tuberculosis associations is on a sound basis and is one of the potent factors in the fall of the tuberculosis death rate. The individual objectives are discussed in convincing detail.

WILLIAMS, L. R. The Scientific Basis of the Program and the Accomplishments of the National Tuberculosis Program. Am. Rev. Tuberc., 18, 8: 249 (Sept.), 1928.

Cost of Nursing Service—A simple method of computing the cost of public health nursing visits is discussed. Although administrative costs are not allocated, the method is recommended because of its simplicity and value in determining costs of specific services, and relative amounts budgeted for each.

WINSLOW, EMMA A. Service Costs and Program Planning. Pub. Health Nurse 20, 11: 569 (Nov.), 1928.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Dental Clinic Services, New York, N. Y.—The dental clinic facilities now serving men, women and children of Greater New York who require free dental care or dental service at moderate costs are not adequate for the needs of this portion of the city's 6,000,000 population, according to a study just published in booklet form by the New York Tuberculosis and Health Association. In one district alone 20,000 school children whose teeth have been examined are waiting to have the necessary dental care done.

These and other significant facts are revealed in the report of a survey made by the association's Committee on Community Dental Service to bring to date a similar study made in 1923 and to review the dental clinic facilities of the city in terms of the community's needs. All the dental clinics in Greater New York, a total of 152, excluding those maintained and operated by specific industries for their employes only, were visited by a trained worker and the facilities and services were studied.

The study also discloses a tendency for dental clinic services to concentrate in Manhattan in spite of the trend of the population to other boroughs.

Since 1923, when the first survey was made, the clinics have increased from 104 to 152. Of the 56 new clinics established during the last 5 years, 35 clinics, or 65 per cent of the total, are in Manhattan. Twelve new clinics, or 21 per cent, are in Brooklyn; 5 clinics, or 9 per cent, in the Bronx; 3 clinics, or 5 per cent, in Richmond.

The study shows that most of the clinics serve only persons living in a specified area, members of a definite group of people such as club members in a settlement house, or patients within certain hospitals. Only one-fourth of the clinics serve the general patient.

Few of the clinics approach self-support, the survey reveals, but, in most cases, the fees charged enable them to be partially self-supporting. The fees vary from no charge in the case of 23 clinics to a fee of $1.50 for one clinic. The common admission fee, however, is $.25. Exclusive of all plant costs which include heat, light, rent and original equipment, the cost of dental care in clinics is estimated at between $3.00 and $3.50 an hour.

The Committee on Community Dental Service of the New York Tuberculosis and Health Association is planning this winter's program in view of the recommendations suggested by this survey. It is making a study of the population centers most in need of dental clinic facilities. It is attempting to interest the individuals and organizations of these districts in providing means to supply services where the need is greatest.

Los Angeles School District—School health officials will find interesting the 1926–27 report of the Department of Health and Corrective Physical Education of the Los Angeles City Schools. The department is divided into 30 sections and has a personnel of 315, including a medical director, 5 assistant directors, 30 physician inspectors, 29 physician consultants, 12 dentists, 62 nurse inspectors, 10 nurse teachers in high schools and 70 physical education teachers, among others. During the year 165,321 children were given physical examinations. According to the report children are examined upon entrance and at least every third year unless special defects require more constant supervision.

Every applicant seeking appointment

on the teaching staff of the city schools has had a careful examination as to physical fitness. A total of 2,550 teachers were examined during the year.

The corrective physical education section after 8 years of growth is able to reach approximately 50,000 children yearly with special care. All the senior and junior high schools have corrective rooms with teachers in charge. Since January, 1926, there have been 13 corrective physical education centers in operation to care for elementary children. From various schools children are sent with bad posture, flat feet, heart affections, nutrition disturbances and paralyses. Once a month an orthopedic specialist examines the most extreme cases of indigent paralytic children. The medical supervision of the examination is cared for by a special physician. It is also stated that 9,000 children with heart defects have been aided by this department.

"The value of nutrition classes is being realized as time advances and the work has had an opportunity to prove itself. Reports on improvement in school work, physical appearance, concentration, coöperation, disposition and general health have been received from the principals in schools where classes were conducted."

Open air sun rooms have been conducted in 10 schools. Eight health centers are utilized in addition to a Traveling Health Unit. The Parent-Teacher Associations coöperate fully in the school health program. The report concludes with a detailed statistical summary of defects found and corrected during the year.

BOOKS RECEIVED

WHITHER MANKIND. A PANORAMA OF MODERN CIVILIZATION. Edited by Charles A. Beard. New York: Longmans, Green, 1928. 408 pp. Price, $3.00.

WHEAT FLOUR AND DIET. By G. O. Swanson. New York: Macmillan, 1928. 203 pp. Price, $2.50.

PARENTS AND CHILDREN. By Ernest R. Groves and Gladys Hoagland Groves. Philadelphia: Lippincott, 1928. 196 pp. Price, $2.00.

BACTERIOLOGY. A TEXT-BOOK OF MICRO-ORGANISMS. By Fred Wilbut Tanner. New York: Wiley, 1928. 548 pp. Price, $4.50.

CONFERENCE OF SOCIAL WORK, MEMPHIS, TENN., MAY 2–9, 1928. Chicago: University of Chicago, 1928. 670 pp.

AN INTRODUCTION TO PRACTICAL BACTERIOLOGY. (2d ed.) By T. J. Mackie and J. E. McCartney. New York: Wood, 1928. 390 pp. Price, $3.50.

THE DOCTOR LOOKS AT MARRIAGE AND MEDICINE. By Joseph Collins. New York: Doubleday, Doran, 1928. 313 pp. Price, $3.00.

HANDBOOK ON VENEREAL DISEASES. By W. Turner Warwick. London: Faber & Gwyer, 1928. 221 pp. Price, $2.00.

THE PRINCIPLES AND PRACTICE OF THE DILUTION METHOD OF SEWAGE DISPOSAL. By W. E. Adeney. New York: Macmillan, 1928. 161 pp. Price, $5.00.

THE HOME DIETITIAN. (3d ed.) Compiled by Ella Mae Ives. Philadelphia: David McKay Co., 1928. 750 pp. Price, $2.50.

WHY NOT GROW YOUNG? OR, LIVING FOR LONGEVITY. By Robert W. Service. Newark: Barse, 1928. 266 pp. Price, $1.50.

PARTNERSHIPS, COMBINATIONS AND ANTAGONISMS IN DISEASE. By Edward C. B. Ibotson. Philadelphia: Davis, 1928. 348 pp. Price, $3.50.

THE KAHN TEST. A Practical Guide. By R. L. Kahn. Baltimore: Williams & Wilkins, 1928. 201 pp. Price, $4.00.

LEAGUE OF NATIONS NEWS

C.-E. A. WINSLOW, DR. P. H.

Technical Conference on BCG—October 15–18, there was held in Paris a meeting of experts to draw up a program of international studies on the Calmette vaccine for tuberculosis. The conference included three special commissions, one of bacteriologists, one of clinicians, and one of veterinarians. The first of these commissions under the chairmanship of Professor Bordet of Brussels concluded that BCG* is a harmless vaccine which does not give rise to progressive tuberculosis, although Professor Nobel of Vienna maintained that in exceptional conditions BCG was capable of producing fatal tuberculosis in laboratory animals. The clinical conference concluded:

1. That BCG administered by mouth to infants within the first 10 days of life and by subcutaneous inoculation in other children and in adults is incapable of producing virulent tuberculosis lesions.

2. That vaccination by BCG produces a certain degree of immunity against tuberculosis.

The veterinary commission concluded that:

1. The experimental facts published and the unanimous opinion of practitioners who have used BCG in cattle justify the conclusions that vaccination carried out according to the technic of Calmette and Guérin, among bovines, is a perfectly harmless procedure.

2. Similar experimental data and published observations with regard to the use of BCG among bovines demonstrate that this strain of bacteria confers definite immunity against both experimental and natural tuberculosis infection. These recognized "pre-immunising" (prémunisantes) qualities justify and encourage the extension of the experimental use of BCG in the prevention of bovine tuberculosis.

* See p. 82 this issue, Editorial "The Calmette-Guérin Vaccine."

An extensive program of further study was recommended and this program has been approved by the Health Committee of the League. The Health Committee expressed no opinion in regard to the conference conclusions cited above.

Fall Meeting of the Health Committee—The Health Committee of the League of Nations held its fall meeting October 25–31, the United States being represented by Professor Alice Hamilton. The committee considered a request from the Council of the League that the health organization should "collect full statistical information regarding alcoholism considered as a consequence of the abuse of alcohol, giving prominence, *inter alia,* according to the data available, to the deleterious effects of the bad quality of the alcohols consumed." The Health Committee finally decided to ask the health administrations, at whose instance the Council's resolution was introduced, those of Finland, Poland, and Sweden, for more precise suggestions as to special lines of inquiry desired.

The Health Committee considered the reports of its malaria commission,* its permanent standards commission† and its special commissions dealing with infant mortality, cancer, and smallpox and vaccination. The infant mortality study is proceeding in a most encouraging manner with detailed inquiries cov-

* See p. 24 this issue, Editorial "A Report with Real Meat." *Pub. Health Rep.,* Nov. 9, 1928, p. 2957.

† *Pub. Health Rep.,* Nov. 9, 1928, p. 2957.

ering periods of 12 months in selected areas in 7 European countries. The cancer commission is at work on a comparison of the results of radiotherapy in cancer treatment, particularly in Munich, Paris and Stockholm. The smallpox and vaccination commission reviewed the evidence as to post-vaccinal encephalitis in England and the Netherlands, concluded that post-vaccinal encephalitis is a definite entity due to an independent virus which becomes active in persons vaccinated against smallpox, and pointed out that accidents of this kind do not occur in young children, emphasizing the importance of early primary vaccination.

The Health Committee has been invited to undertake a special study of dengue fever in southern Europe and to collaborate in a reorganization of the public health service of Greece, both of which enterprises will be undertaken in the near future.

NEWS FROM THE FIELD

CINCINNATI LAUNCHES A CAMPAIGN AGAINST DIPHTHERIA

THE Cincinnati Health Department under auspices of the Cincinnati Academy of Medicine has launched a campaign for the immunization of all preschool children against diphtheria. It is in this age group that 90 per cent of the diphtheria cases and 60 per cent of the diphtheria deaths occur. Parents are urged to take their children to the family physicians for toxin-antitoxin treatment. Free clinics have been established to provide treatment for those children whose parents are unable to pay for medical service.

OAKLAND IMMUNIZES ITS CHILDREN

THE City Health Department of Oakland, Calif., under direction of Dr. C. R. Fancher, City Health Officer, has begun a campaign for the immunization of all Oakland children against diphtheria and scarlet fever. No fee is charged for the treatment and there has been a most satisfactory response of children to be immunized.

CANADIAN HOSPITAL LIBRARIES CONDUCTED BY COLLEGE WOMEN

IN two hospitals of Montreal and Quebec, Can., libraries are managed and to a large extent financed by a committee of alumnae of McGill University, Montreal. This library program is the outgrowth of the libraries organized in 1917 for the military hospitals. The library in the military hospital at Ste. Anne de Bellevue has 5,236 volumes, and although this is a hospital caring mostly for mental cases the circulation last year was 6,615 books. The Royal Victoria Hospital for civilians contains 3,219 books and the circulation in 1928 was 23,114, an average of 74 books a day.

SCHICK AND DICK TEST OBLIGATORY AMONG MEXICAN SCHOOL CHILDREN

IN the government schools of Mexico the Schick test for diphtheria and the Dick test for scarlet fever are compulsory for all pupils coming within certain age limits and the tests and treatment administered upon recommendation are given by public health and school physicians.

GIFT OF $100,000 FOR CANCER TREATMENT

A GIFT of $100,000 was recently given to the Graduate School of Medicine, University of Pennsylvania, for the purchase of a gram of radium and other accessories for the treatment of cancer. The gift is from Louis J.

Kolb, of Germantown, Pa., a graduate of the University of Pennsylvania, class of 1887. The radium will cost about $72,000 and the balance of the gift will be used for cancer research. The fund will be known as the Louis J. Kolb Foundation for Treatment of Cancer. Dr. George E. Pfahler, professor of radiology and a former president of the American Roentgen Ray Society, will be in charge.

The university has also received a gift of $45,000 for cancer research from Irene duPont.

CHILD LABOR DAY

CHILD Labor Day will be observed January 26, 27 and 28 and the National Child Labor Committee under whose auspices this week has been inaugurated is asking the coöperation of schools, clubs, churches, private and public agencies to bring before the people of the country the problems of child labor so that public opinion eventually will be aroused to the complete abolition of child labor and universal legislation will be effected ruling against it.

OFFICERS OF MISSOURI CONFERENCE ON WATER PURIFICATION

AT the Fourth Annual Missouri Conference on Water Purification held at Hannibal, Mo., November 17, the following officers were elected: *Chairman*—C. E. Heflin, Water Commissioner, Cameron, Mo.; *Vice-Chairman*—S. J. Duncan, Superintendent Water Works, Moberly, Mo.; *Secretary-Treasurer*—H. D. Peters, Assistant Engineer, State Board of Health of Missouri; *Executive Committee*—W. V. Wier, Assistant Manager, St. Louis County Water Company, University City, Mo.; E. E. Wolfe, City Chemist, Hannibal, Mo.; W. P. Britain, Superintendent Water Works, West Plains, Mo.; J. N. Wells, Superintendent, Joplin Water Works Co., Joplin, Mo.

Among the several changes made in the constitution of the Conference was the change of the name to Missouri Water and Sewerage Conference in order to indicate the present scope of interest including municipal sewerage as well as water systems. Effort will be made for affiliation with the Conference of Sewage Works Associations. There was an attendance of 75 members.

DR. WILLIAMS RESIGNS AS NEW MEXICO COUNTY HEALTH OFFICER

DR. D. B. Williams, chief, Division of County Health Work, New Mexico State Bureau of Health, resigned January 1 after 6 years of service. The resignation of Dr. Williams was made necessary because of lack of funds to continue his salary and to meet the necessary traveling expenses. During his 6 years of service half of the expenses of this service was met by a grant from the Rockefeller Foundation, but the grant ceased January 1 and local funds were not available to carry on this county health program.

RASKOB MEMORIAL FOUNDATION TO AID NEEDY CHILDREN

THE Bill Raskob Foundation, incorporated with $1,000,000, has been established for the relief and assistance of needy children. The Foundation was established by John J. Raskob, chairman of the Democratic National Committee, in memory of his son, William Frederick Raskob, 2d, who was killed last fall in an automobile accident. Headquarters of the Foundation will be in Wilmington, Del.

DIRECTORY OF CITY HEALTH OFFICERS

A DIRECTORY for 1928 of health officers of cities of 10,000 or more population in the United States has been published in Volume 43, Number 46 of *Public Health Reports*, published by the U. S. Public Health Service, U. S.

Treasury Department. This has been published especially for the benefit of health officers and others interested or engaged in public health work. The data included in the directory have been furnished by the health officers of the cities. A directory of city health officers has been published by the U. S. Public Health Service each year since 1916.

HIGH RATE OF DEATHS FROM AUTOMOBILE ACCIDENTS

ACCORDING to an announcement made by the U. S. Department of Commerce, in the registration area of continental United States there were 21,160 accidental deaths in 1927 due to automobiles and other motor vehicles, excluding motorcycles, and the death rate from this cause was 19.5 per 1,000 population against 17.9 in 1926, 17 in 1925, 15.7 in 1924 and 14.9 in 1923.

The deaths assigned to automobile accidents do not include those due to collisions of automobiles with street cars and with railroad trains. In 1927 there were 476 deaths due to collisions of automobiles with street cars and 1,676 due to collisions with railroad trains.

REGISTRATION WORK IN NEW MEXICO AIDED BY ROCKEFELLER FOUNDATION

THE State Bureau of Public Health, New Mexico, has received an allotment of $200 a month for additional help on its birth and death registration program. The other agencies aiding New Mexico in its effort to get into the U. S. Registration Area are U. S. Bureau of the Census, U. S. Children's Bureau, and the American Public Health Association.

$204,400,000 GIVEN FOR HEALTH IN 1927

HEALTH activities received $204,400,000 from philanthropic donations during 1927. This sum was parceled out in the following sums: hospitals, $163,500,000; dispensaries, $9,600,000; public health nursing, $11,800,000; medical research, $13,000,000; health education, $6,500,000.

Education received $187,200,000; organized charitable relief in the United States, $256,700,000; play and recreation, $19,300,000; fine arts, $25,700,000; miscellaneous reform organizations, $13,000,000; religious purposes, $1,079,900,000; foreign relief including Armenia and the Near East, Austria, Poland, Germany, the Baltic States, Russia, Italy, the Balkans, China and Ireland, $214,500,000.

RACINE CHECKS UP HARD OF HEARING

IN Racine, Wis., recently the Board of Education requested the Board of Health to examine 40 children suspected of having difficulty with their hearing. The basis taken was 30 per cent disability. Examination showed that 13 of these pupils were over 30 per cent deaf in both ears; another 13 in one ear; 9 had loss of hearing in one or both ears of less than 30 per cent, and 5 had no actual loss of hearing, although some of them showed evidences of ear disease which if not checked might cause some degree of deafness.

Deafness was traced to diseased tonsils, enlarged adenoids; deafness following scarlet fever, measles, mastoid infections and influenza. Two children had badly constructed noses, and one suffered a running ear following an injury from a stone.

BIRTH REGISTRATION IN SANTA FE COUNTY, N. M.

SANTA Fe County, N. M., has been practically perfect in every check made on its birth and death registration. H. P. Mera, M.D., County Health Officer, attributes this to the close follow-up work and personal interest of his subregistrars. This explanation is made in the *Bulletin* of the New Mexico State Bureau of Public Health.

SIXTH SANITARIANS' SHORT SCHOOL OF TEXAS

AT the Sixth Sanitarians' Short School of Texas held early in November in San Antonio, 190 sanitarians were present. It was voted to hold the 1929 meeting in the lower Rio Grande Valley at Edinburg, Tex.

The following officers were elected: *President*—Dr. J. R. Mahone, whole-time county health officer, Edinburg; *First vice-president*—H. L. Darby, U. S. Department of Agriculture, Fort Worth; *Second vice-president*—Jack Wyatt, city chemist and director of sanitation, Amarillo; *Third vice-president*—Miss Delight Stone, supervising city health nurse, San Antonio; *Fourth vice-president*—Edgar Whedbee, assistant water supply engineer, Dallas; *Secretary-treasurer*—E. G. Eggert, sanitary engineer, State Department of Health, Austin.

WARNING AGAINST FRAUDULENT RAT EXTERMINATORS

EXPERT rat exterminators began a campaign among health officials and manufacturers during the summer in South Carolina, getting endorsement of the health officers, and money in advance of service in several instances from the manufacturers, but they failed to carry out their work against the rodents. This information comes to the *American Journal of Public Health and the Nation's Health* from Irving S. Barksdale, M.D., Commissioner of Health, Greenville, S. C.

The trio consisted of H. C. Noonan, T. H. Cooper and C. F. Hinman. The last named, however, did not appear in Greenville at any time. According to Dr. Barksdale the first two named came to Greenville with many references as to their ability and perseverance as rat exterminators. For two or three weeks after their arrival they apparently made an endeavor to render some service, but spent most of their time obtaining contracts and securing advance payments payable to the City Rat Campaign. This "City Rat Campaign" was unknown to Dr. Barksdale and unauthorized by him.

The exterminators baited several places, using, as some purchasers of the service estimate, about one dollar's worth of rat poison, and then disappeared very suddenly. Apparently they canvassed many cities of that southern area, obtaining contracts.

In making an exposé of the trio Dr. Barksdale has written to the Editor of the *American Journal of Public Health and the Nation's Health:* "I think you would render other health officials a great service if you would warn them against these self-styled expert rat exterminators. Their motives and methods seem very fraudulent."

DR. FRANCIS CONTRACTS MALTA FEVER

WHILE experimenting in his laboratory on the disease, Dr. Edward Francis, noted scientist of the U. S. Public Health Service and an authority on tularemia, contracted Malta fever recently. It is believed by laboratory associates that he acquired this cattle disease from cultures on which he had been working. Dr. Francis discovered that Malta fever is transmitted through milk of infected animals to human beings.

CALIFORNIA NURSES' HEADQUARTERS MOVE TO SACRAMENTO

THE Bureau of Registration of Nurses of the California State Department of Public Health, which has been located in the State Building, San Francisco, Calif., for several years, has moved to 405 Capitol Office Building, Sacramento.

All communications to this bureau should be addressed to P.O. Box 1159, Sacramento, Calif. The removal of the nurses' bureau to Sacramento is part of the reorganization of the state departments.

TRUCAS, N. M., TO CHECK SPREAD OF TYPHOID

UPON report that 7 cases of typhoid fever had developed at Trucas, N. M., J. I. Dunham, County Health Officer, immediately announced that the entire school population and at least 100 adults would be given typhoid vaccine injections, which means the inoculation of about 250 persons.

TEXAS WATER WORKS SCHOOL

THE Eleventh Texas Water Works School will be held January 14–25, 1929, at Bryan Agricultural and Mechanical College.

The school will be divided into several sections, including an elementary course in water works and sewage plant operation and sanitation.

DR. RECTOR GOES TO CHICAGO MEDICAL SOCIETY

FRANK L. Rector, M.D., Fellow A. P. H. A., formerly editor of *The Nation's Health*, and a member of the Chicago Medical Society, has been engaged as executive secretary of the Chicago Medical Society. Dr. Rector has just completed a report of a survey of health and hospital work in state and federal prisons.

PERSONALS

EMILY B. HEARD, R.N., has been appointed by the New Mexico State Bureau of Health as a field nurse under the Sheppard-Towner program for improving birth and death registration in the state. Her first assignment will be Otero County, N. M. Miss Heard has been engaged in public health nursing in Tennessee and Virginia.

DR. THURSTON W. LARAWAY is the new Health Officer of Elk River, Ida.

DR. C. M. BURCHFIEL has been appointed County Health Officer of Santa Clara County, Calif., by the board of supervisors to succeed the late Dr. William Simpson.

DR. H. B. EHLE, Health Officer of Lassen County, Calif., died in San Jose in October.

MRS. BEULAH M. KEITH has been appointed City Health Officer of Beaumont, Riverside County, Calif., to succeed Miss Beaunes Anderson.

DR. A. M. BURT, Health Officer of Ballston Lake, N. Y., died October 27.

CONFERENCES

January 16–18, American Society of Civil Engineers, New York, N. Y.

January 18–19, American Social Hygiene Association, New York, N. Y.

January 21, National Child Welfare Association, New York, N. Y.

January 22–23, Southwestern Tuberculosis Association, Ft. Worth, Tex.

January 28–31, American Society of Heating and Ventilating Engineers, Chicago, Ill.

January 29, Conference on Mental Hygiene in Public Health and Social Work, Boston, Mass.

February 23–March 2, Parents' Exposition, New York, N. Y.

February 24–28, National Education Association, Cleveland, O.

FOREIGN

April 3–6, Permanent International Committee on Occupational Diseases, Lyons, France.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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Our National Accident Problem*

CHARLES B. SCOTT

President, Bureau of Safety, Chicago, Ill.

IT was estimated that in the year 1927 there were 95,500 persons killed in accidents in the United States, an increase of 4 per cent over 1926. If the increase this year is as great, the number for 1928 will be almost 100,000. The probable loss of 100,000 lives in accidents in one year certainly constitutes an important national problem.

Its importance is emphasized by a comparison with other causes of death. U. S. Bureau of the Census figures for 1926 indicate that in that year there were only 6 diseases with higher death rates than the rate for accidents. These were heart disease, pneumonia, nephritis, cancer, tuberculosis, and cerebral hemorrhage. For men only the importance of accidents is even more striking. In the year 1926 there were only 2 diseases among men which caused more deaths than were caused by accidents. These were heart disease and pneumonia. For women only, accidents stand 7th in importance among the various causes of death.

We have not sufficient information to classify accurately these 95,500 fatalities in accordance with the place where the accident occurred. We do know quite definitely, however, that about 25,800 of them were the result of automobile accidents. This is an increase of 1,050 per cent in number of deaths since 1911, and an increase of 400 per cent in the death rate per 100,000 population since 1913. This information on automobile deaths is made available through the records of the U. S. Bureau of the Census. But to what are the remaining 70,000 deaths due? In addition to these motor vehicle accidents there are several other main groups of accidents on which our information is less complete. There are in addition to motor vehicle acci-

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

dents other accidents that occur in public places but where a motor vehicle is not involved. In addition there are accidents occurring in industry and in homes. By a process which necessarily includes a great deal of guess work, statisticians of the National Safety Council estimate that about 25,000 of these 70,000 deaths occur in home accidents, another 25,000 in industrial accidents, and the remaining 19,700 in public (not motor vehicle) accidents.

The seriousness of our accident problem is emphasized by a comparison with those in other countries. Whereas the death rate from accidents in this country in 1926, according to the U. S. Bureau of the Census reports, was 78.6, the accidental death rate in England and Wales was only 35.6, in Scotland 44.9, and in New Zealand 52.3. These are the only foreign rates available but I am sure that if the records of other countries were before us we should find the United States well in the lead on the question of accidents as a cause of death.

Some interesting changes have occurred in accidental death rates over a period of years. In 1913, which is ordinarily taken as a normal pre-war year, the death rate from accidents was 85.5 per 100,000 population. This may be contrasted with the 80.5 per 100,000 in 1927, which is a drop of 6 per cent. The decrease has not been a consistent one, however, there being a gradual decline up to 1921 when the accidental death rate was 68.7 and an increase since that time. The decrease from 1913 to 1921 was 20 per cent and the increase from 1921 to 1927, 17 per cent. If the accidental death rate in 1927 had been as high as in 1913 there would have been 101,400 lives lost in accidents last year, or 5,900 more than the actual loss. If, however, the 1927 rate had been as low as that of 1921 the loss would have been only 81,500, 14,000 less than actually met death in this way.

The death rates from accidental causes are by no means uniform in the various age groups. Children are particularly subject to the hazards of accidents. On the basis of U. S. Bureau of the Census data there are only 2 diseases which cause more deaths among children from 1 to 4 years of age than accidents. These are bronchial pneumonia, and diarrhea and enteritis. Between the ages 5 and 14 years the situation is even more severe, for we find that accidents cause more deaths than does any disease. No one will deny that tuberculosis takes a heavy toll of lives between the ages 10 and 20 years and yet we find that in the first half of this period accidents cause twice as many deaths as tuberculosis, and in the second half two-thirds as many deaths as tuberculosis. These figures prove beyond any doubt that the national accident problem is indeed a serious one.

Organized safety work began in industry. The National Safety

Council was formed by industrial people who realized the importance of accidents both in their own plants and to society as a whole. Over the last 15 years interest in accident prevention work has extended to every phase of our national life, and therefore the scope of the council's activity has accordingly broadened. Throughout all this development it has again and again been proved that effective accident prevention work must be based upon complete data relative to accident causes. This is strikingly true in the industrial accident field, in which I have had most of my personal experience in accident prevention work. May I mention just one experience?

Very complete records of accidents that were kept under my supervision of safety work in certain public utilities indicated that, over a period of years, only 7 per cent of the accidents were charged to electricity. On the face of it this would not seem to be outstandingly important among all causes of accidents. However, further investigation of the records showed that these same accidents, while they amounted to but 7 per cent of the total number of accidents, resulted in 75 per cent of the total number of fatalities. This was clear evidence of the importance of the electrical hazard, and of the necessity for more stringent requirements to combat it. This is mentioned to show that detailed information on the circumstances and causes of accidents should form the basis of effective prevention work.

We are not sure how rapidly the industrial accident problem is being solved, because complete data on the subject are not available. We do know that in many instances industrial firms by careful analysis of their accident records, and persistent application of safety methods, have produced amazingly fine results. But at the very best the only information about accidents that can be obtained by industries will relate to industrial accidents only, and as a matter of fact it is only in industries covered by compensation laws that we have gotten very far along this line. We need data on industrial accidents that are not covered by compensation laws and we need data on the other 70,000 fatalities each year.

DISCUSSION

W. THURBER FALES, FELLOW A. P. H. A.

State Registrar, State Board of Health, Montgomery, Ala.

THE ever increasing toll in life and economic loss of accidents in this country demands attention not only of bureaus of safety, traffic managers, and factory superintendents, but demands the serious attention of the health authorities of America. Accident prevention requires the attention of health authorities because

deaths by accident form a considerable portion of the total death rate. In 1910 the death rate from the 5 infectious diseases, typhoid fever, measles, scarlet fever, whooping cough and diphtheria, was 80.2 and the death rate from all accidental deaths (homicides and suicides exclusive) was 84.4. In 1926 the corresponding rates were 35.6 for the 5 infectious diseases and 78.6 for total accidents. In 1910 typhoid fever death rate was 23.5, and that from automobile accidents was 1.8; the rates for 1926, of 6.5 and 17.9 respectively, show that the saving in lives from reduction of typhoid fever has been nearly counterbalanced by the increase in the deaths from automobile accidents. In other words, we saved 17 lives from typhoid fever in each 100,000 population and lost 16 additional lives through fatal automobile accidents.

Further, the large number of children who lose their lives daily through preventable accidents moves all who are interested in the conservation of child life. For example, 27.1 per cent of accidental deaths in Alabama are of children under 15 years of age, 19.3 per cent of fatal automobile accidents and 57.5 per cent of accidental burns.

Before a constructive and educational program for accident prevention can be carried out, we agree with Mr. Scott that more facts concerning the incidence of and circumstances under which accidents occur must be had. We all recognize the inadequacy of the classification of accidental deaths of the International List. Radical changes in this classification are not to be expected, and perhaps justifiably so if comparability with our past statistics on fatal accidents is to be preserved. Further, the enlargement of the death certificate to furnish additional information is out of the question. Therefore, additional information must be secured through some form of supplemental report.

It should be remembered that the supplemental report must be simple and that in most instances, for the present at least, it must be filled out through the voluntary coöperation of registrars, coroners, undertakers and others. Our daily querying of death certificates shows that doctors, registrars and undertakers will answer supplemental questions if pertinent to the case.

During the last couple of years Miss Hawley, my assistant, has queried all deaths from burns in order to secure information as to cause. This information has been valuable especially in showing the tremendous importance of unprotected fireplaces in this particular problem.

At the meeting of the Public Accident Statistics Section of the National Safety Congress in New York, October 2, 1928, Dr. DePorte proposed a very simple form for use by state registration offices. This form appears entirely practicable. Alabama purposes using a similar form, modified in unimportant details, next year to secure supplemental data concerning fatal accidents. We hope that many states represented at this meeting will undertake the securing of additional information in case of fatal accidents and I believe that for the present the National Safety Council would be the logical agency to correlate the reports from the various states on this problem.

The Biochemical Oxidation of Phenolic Wastes*

F. W. MOHLMAN, PH. D.

Chief Chemist, The Sanitary District of Chicago, Chicago, Ill.

THE biochemical oxidation of phenolic wastes mixed with sewage undoubtedly appeals strongly to the manufacturer, since this method of disposal is very convenient and of low cost from his standpoint. Before recommending such a method of disposal it is desirable to have considerably more information than we now have concerning the effect of these wastes on the rates of treatment of sewage on trickling filters and in the activated sludge process. Ammonia-still wastes contain organic solids which affect materially the character and composition of sewage. Increase in concentration of sewage requires larger acreage of trickling filters or increased aeration period and air consumption in the activated sludge process. It is conceivable that increased cost of operation of the sewage works receiving such wastes might be far greater than the cost of treating the wastes at the by-products coke plant.

Phenolic wastes are produced in two by-products coke plants in South Chicago, namely the By-Products Coke Company and the Wisconsin Steel Company.[1] A third plant, a subsidiary of the Youngstown Sheet and Tube Company, started operation in October, 1928. This plant is directly at the mouth of the Calumet River, a short distance from the 68th Street intake of the Chicago water supply. It would be quite unsafe to discharge ammonia-still wastes into the river or the lake at the Youngstown plant; consequently, studies have been made by the Sanitary District of Chicago concerning the practicability of discharging these wastes into the intercepting sewer tributary to the Calumet Sewage Treatment Works. In connection with these studies research has been carried on in the laboratories of the Sanitary District on the general subject of phenol wastes in sewage. This paper deals with some of the results of these studies.

In our main laboratory increasing concentrations of ammonia-still wastes were added to samples of settled sewage from Des Plaines Treatment Works, which is of average strength and contains no indus-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

TABLE I

CHEMICAL ANALYSIS OF AMMONIA-STILL WASTE—MAYWOOD SEWAGE MIXTURES

Parts per Million

August 29, 1928	Nitrogen as			Biochemical Oxygen Demand		Suspended Solids			Oxygen Consumed $KMnO_4$	Alkalinity as $CaCO_3$	Phenol (calculated)	Total Solids	pH	Bact. Counts Agar 48-hour
	Total Organic +Amm.	Org.	Amm.	5-day	10-day	Total	Volatile	Fixed						
Raw Sewage	18.6	3.4	15.2	110	120	74	58	16	25.0	320	0.02	1134	7.4	343,000
R.S. + ½% Waste	19.4	4.2	15.2	136	170	82	64	18	58.8	322	14.5	1152	7.5	380,000
R.S. + 1% Waste	21.0	5.6	15.4	165	210	87	54	33	125.0	324	28.9	1196	7.5	880,000
R.S. + 2% Waste	23.4	7.8	15.6	200	225	108	72	36	181.0	328	57.8	1222	7.5	880,000
R.S. + 3% Waste	25.8	9.8	16.0	247	310+	136	108	28	234.0	332	86.7	1290	7.6	289,000
Amm.-Still Waste											2886			

trial wastes. The effect of the wastes on the results of various chemical or biochemical determinations is shown in Table I.

The ammonia-still waste used contained 2,886 p.p.m. phenol. One per cent therefore added 28.9 p.p.m. phenol to the sewage. The maximum amount of waste added was 3 per cent, equivalent to 86.7 p.p.m. phenol.

It will be noted that the increase of ammonia nitrogen was negligible, but of organic nitrogen quite considerable. The biochemical oxygen demand showed a very great increase, although not nearly so great in percentage of the original amount as the increase in the permanganate oxygen consumed. Suspended and total solids increased markedly. Alkalinity and pH increased slightly. Bacterial counts increased from 343,000 per c.c. in the sewage up to 880,000 in the 2 per cent sample, then decreased to 289,000 in the 3 per cent sample.

These analyses show clearly the very marked effect of one or two per cent of this waste on the biochemical oxygen demand of sewage. In Table II it is shown that the average B. O. D. equivalent of 1.0 p.p.m. phenol in ammonia-still wastes was 1.68 p.p.m. for the 5-day B. O. D. and 2.37 p.p.m. for the 10-day value. It happens that the

TABLE II

B. O. D. OF PHENOL WASTES

p.p.m. Biochemical Oxygen Demand per p.p.m. Phenol in Wastes

Range Per Cent Waste	p.p.m. B. O. D. per p.p.m. Phenol 5-day	10-day
0–1	1.90	3.11
0–2	1.56	1.82
0–3	1.58	2.19
Avg.	1.68	2.37

Oxygen Required for Complete Chemical Oxidation of Phenol

$$C_6H_5OH + 7O_2 = 6CO_2 + 3H_2O$$

$$94 : 224 = 1 : 2.38$$

latter factor is approximately equal to the chemical equivalent for the oxygen required for the complete oxidation of phenol to water and carbon dioxide. This is probably an empirical agreement inasmuch as the sulphocyanides and other organic compounds in the ammonia-still wastes also require oxygen, in addition to the phenols.

These oxygen relations indicate that the addition of even less than 2 per cent of ammonia-still wastes produces a relatively enormous increase in the biochemical oxygen demand.

The B. O. D. of the Imhoff effluent at the Calumet Treatment Works in 1927 was only 57 p.p.m.; the addition of 1.2 per cent of ammonia-still waste of the average concentration used in this test would double the B. O. D. The wastes from the Youngstown plant alone would add approximately 3 p.p.m. phenol and increase the B. O. D. by 5 p.p.m.; wastes from all three plants would add 17.0 p.p.m. phenol, increasing the B. O. D. by 28.0 p.p.m. It is apparent that before ammonia-still wastes should be permitted to be discharged into the sewers a careful study must be made of the increased cost of operation due to the presence of the wastes.

TOLERANCE OF SEWAGE FILTERS AND ACTIVATED SLUDGE FOR PHENOLIC WASTES

Sand Filters—In order to obtain information concerning the maximum amount of phenolic wastes permissible in sewage treated by biological processes, small-scale experiments were started at the Calumet Treatment Works in March, 1928. Six small intermittent sand filters were constructed in galvanized iron cans 1.13 ft. in diameter. The depth of sand was 3.0 ft., and the surface area of each 1.0 sq. ft. The first filter was used as a control and was dosed with settled sewage; the others were dosed with the same sewage containing increasing proportions of ammonia-still waste from the Wisconsin Steel Company which usually contained about 2.9 gm. phenol per liter. Each filter was dosed at the rate of 100,000 gallons per acre per day, applied in three applications per 24 hours. Composite samples of influents and effluents were analyzed twice per week. Average results for April and May, 1928, are given in Table III.

Study of the influent analyses of Table III shows the marked increase of B. O. D. when 1.0 or 2.0 per cent of waste was added—from 40 to 72 and 114 p.p.m. respectively. The addition of even 0.1 per cent waste produced a noticeable increase in the concentration of the influent.

Effluent analyses show that with 0.1 per cent waste there was no appreciable deterioration in the quality of the effluent; with 1.0 per

TABLE III

INTERMITTENT SAND FILTRATION OF SETTLED CALUMET SEWAGE PLUS INCREASING AMOUNTS OF AMMONIA-STILL WASTE

Rate of Filtration, 100,000 Gallons per Acre per 24 Hours
Results in p.p.m.

Average of Nine Analyses of Composite Samples, April and May, 1928

Sample	Nitrogen as Organic + Amm.	Org.	Amm.	Nitrites + Nitrates	5-day B. O. D.	Total Solids	Oxygen Consumed	Phenol
			Control : Settled Sewage					
Influent	8.1	2.6	5.5	0.7	40.0	772	36	—
Effluent	0.9	0.5	0.4	7.0	0.7	722	16	—
			1 Part Waste : 999 Parts Sewage					
Influent	8.6	3.3	5.3	0.7	48	742	45.5	2.7
Effluent	0.9	0.5	0.4	6.6	1.0	687	11.9	0.7
			1 Part Waste : 99 Parts Sewage					
Influent	9.6	4.3	5.3	0.8	72	762	82.6	22.0
Effluent	2.3	1.1	1.2	8.1	2.7	—	18.0	1.0
			1 Part Waste : 49 Parts Sewage					
Influent	12.1	6.2	5.9	0.8	114	797	143	43.9
Effluent	10.6	2.0	8.6	2.6	2.7	—	31.0	1.1
			1 Part Waste : 9 Parts Sewage (March, Previous Series)					
Influent	34.3	22.0	12.3	1.3	330	866	635	252
Effluent	20.8	9.3	11.5	1.4	21.9	—	181	81.5
			Total Calumet Amm.-Still Wastes : Total Calumet Sewage					
Influent	10.4	4.8	5.6	0.8	69	773	49.2	17.1
Effluent	2.4	1.5	0.9	7.6	1.6	746	15.0	0.9

cent waste a satisfactory effluent was obtained, although not as low in ammonia and organic nitrogen, B. O. D., or oxygen consumed as the control, but slightly higher in nitrate. When 2.0 per cent of waste was added, the effluent was decidedly inferior, with 10.6 p.p.m. combined ammonia plus organic nitrogen, only 2.6 p.p.m. nitrite plus nitrate nitrogen, and the excessive value of 31.0 p.p.m. for oxygen consumed. This was not the satisfactory effluent that should be produced by an intermittent sand filter in good condition. The 10 per cent dilution of wastes gave a totally unsatisfactory effluent. The last filter, treating wastes from all plants in the proportions as produced, compared with Calumet sewage, gave a satisfactory effluent.

These results demonstrated that it is possible to handle influents containing up to somewhere between 25 and 35 p.p.m. phenol without serious interference with the biology of intermittent sand filtration. Later tests indicated that it might be possible to reach the higher concentration.

These tests must be considered to be more or less qualitative and not authoritative with regard to accurate determination of the rates

of filtration that may be obtained on a large scale. There is no doubt that the rate would have to be reduced as the proportion of waste increases.

Activated Sludge—We have made no experiments with phenolic wastes and activated sludge. In order to be conclusive these should be made in an operating continuous-flow plant and should extend over a period of several months. A test of a week or two is not sufficient inasmuch as the large initial bulk of activated sludge will adsorb rather large amounts of the phenolic wastes during at least the first few days, and then later lose much of its adsorptive properties. The frequently quoted tests made at Milwaukee* in 1920 were hardly conclusive for this reason inasmuch as they extended over only 11 days, but notwithstanding the short time of the tests, the removal of phenols was so complete as to give assurance that the concentrations treated during the earlier days of the test could be handled indefinitely. It is unfortunate that the statement has been made so frequently that 2.0 per cent ammonia-still wastes were treated, since the concentration of the wastes was quite low, averaging only 0.78 gm. per liter as compared with the 2.5 to 3.0 gm. per liter usually found in wastes from the direct process. Throughout this paper the proportions have been expressed in actual concentrations of phenol in the sewage treated.

The Milwaukee results have been re-calculated as shown in Table IV. It will be noted that approximately 14.0 p.p.m. phenol was applied most of the time, increasing to 21, 30, 48 and 61 p.p.m. during the last four days of the test. Inspection of the bacterial results

TABLE IV

EXPERIMENTAL ACTIVATED SLUDGE TREATMENT OF MIXTURES OF MILWAUKEE SEWAGE AND AMMONIA-STILL WASTE*

Waste Contained 0.78 gm. Phenol per Liter

Date 1920	Gallons per 24 Hours			Per Cent Ammonia-Still Waste is of Sewage	Phenol Treated		Bacteria in Effluent 1,000 per c.c.	
	Sewage	Ammonia Condensate Liquor	Total to Aeration Tank		Lb. per 24 Hours	Parts per Million	Control: No Waste Present	Waste Present
Aug. 31	28,080	294	28,374	1.04	1.91	8.1	—	—
Sept. 1	71,800	1,224	73,024	1.70	7.96	13.3	141	143
2	70,800	1,296	72,096	1.82	8.42	14.0	154	134
3	70,800	1,308	72,108	1.85	8.50	14.1	347	306
4	72,100	1,344	73,444	1.87	8.73	14.3	191	278
5	71,200	1,262	72,462	1.77	8.21	13.6	89	246
6	71,500	1,270	72,770	1.78	8.26	13.6	179	276
7	70,400	1,924	72,324	2.74	12.50	20.8	153	210
8	70,900	2,796	73,696	3.94	18.40	29.5	200	256
9	69,200	4,547	73,747	6.56	29.50	47.9	131	379
10	8,880	758	9,638	8.54	4.93	61.2	190	574

* Seventh Annual Report, Milwaukee Sewage Commission, Aug. 31–Sept. 10, 1920.

shows a consistently higher count in the effluent from the sewage plus wastes than from sewage alone, the increase in the former becoming rather excessive when more than 29.5 p.p.m. of phenol was present.

Further data should be available from the Milwaukee plant since it has been in full-scale operation.

Experimental tests have recently been made at Waldenburg[3] near Breslau, in Silesia, Germany. A very small-scale activated sludge plant was operated for 5 weeks at the rate of 1 liter per second. Ammonia-still wastes were added to give a concentration of 9.1 p.p.m. phenol during the 1st week, 18.2 p.p.m. the 2d week, 27.3 the 3d week, 36.4 the 4th week and 45.5 the 5th week. The results indicated complete removal at least through the 4th week (36.4 p.p.m.), and no serious impairment of the quality of the effluent until the 5th week.

The Milwaukee and Waldenburg results indicate that the activated sludge process may be able to handle up to 30 or 40 p.p.m. phenol from ammonia-still wastes without serious impairment of the quality of the effluent. The increase of air consumption or aeration period required by this concentration of wastes has not been conclusively determined.

NATURE OF OXIDATION OF PHENOLIC WASTES—AEROBIC AND ANAEROBIC CONDITIONS

The biological destruction of phenol in ammonia-still wastes appears to be accomplished by obligate aërobes. Anaerobes seem to be unable to decompose the phenol, unless very long periods of contact are permitted.

As an example of this difference an experiment was made in which approximately 30 p.p.m. phenol in ammonia-still wastes was added to Calumet sewage. The sample was divided into two equal portions. One portion was aerated in a 2-gallon bottle, the other placed in tightly stoppered quart bottles. A sample was taken from each portion each day and analyzed for phenol. The reduction of the phenol in the aerated sample between the 2d and 3d day was remarkable, the phenol decreasing from 29.9 to 2.9 p.p.m. The anaerobic sample remained completely unchanged for 4 days. Indeed, Fowler[4] has reported no change under anaerobic conditions for 14 days, while even after 8 months a large proportion of the phenol originally present (100 p.p.m.) was unaffected.

In some recent tests of sludge digestion in our main laboratory, 250 p.p.m. phenol was added to fresh sewage solids. After 138 days' digestion at room temperature the phenol content had dropped to 13.7 p.p.m., indicating considerable loss.

The relative effect of phenol on aerobes and anaerobes has

quite recently been investigated by Scott[5] at Manhattan, Kan.

He exposed pure cultures of aerobes and anaerobes, growing in liver broth, to 0.5 per cent phenol. Sub-cultures were made after intervals up to one month. None of the anaerobic spore formers were destroyed in one month either at 37° C. or room temperature. Increasing the strength to 1.0 per cent phenol had no further effect. At 5.0 per cent phenol some anaerobes were sterilized in a few days but others survived for 10 days. Aerobic spore formers withstood 0.5 per cent phenol but not higher concentrations. Non-spore-forming anaerobes withstood 0.5 per cent but all non-spore-forming aerobes were killed at this concentration.

These observations indicate that anaerobes are in general far more resistant than aerobes. This confirms the fact that large concentrations of phenol are required before sludge digestion is inhibited seriously.

Effect of Re-inoculation—The biological filters that have been used by Fowler,[6] Bach,[7] and Brown[8] for the treatment of concentrated phenolic wastes depend upon the re-circulation of from 80 to 90 per cent of the filtered effluent for dilution and inoculation of the influent

FIGURE I

EFFECT OF RE-INOCULATION ON RATE OF BIOCHEMICAL OXIDATION OF PHENOLIC WASTES

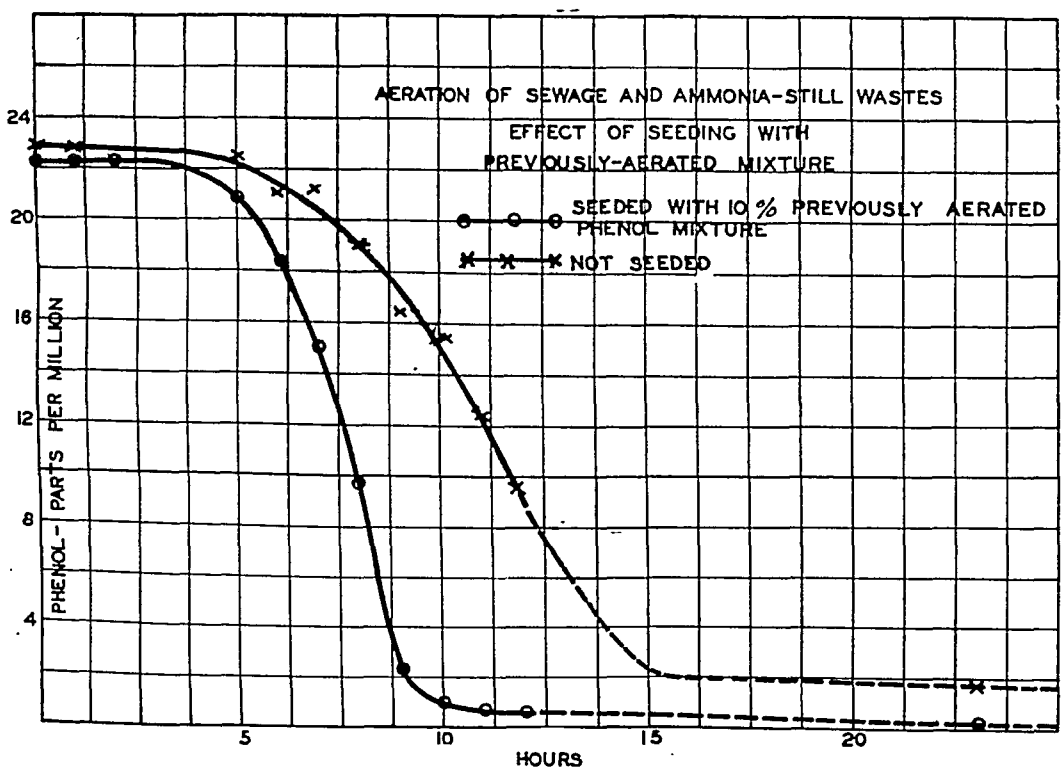
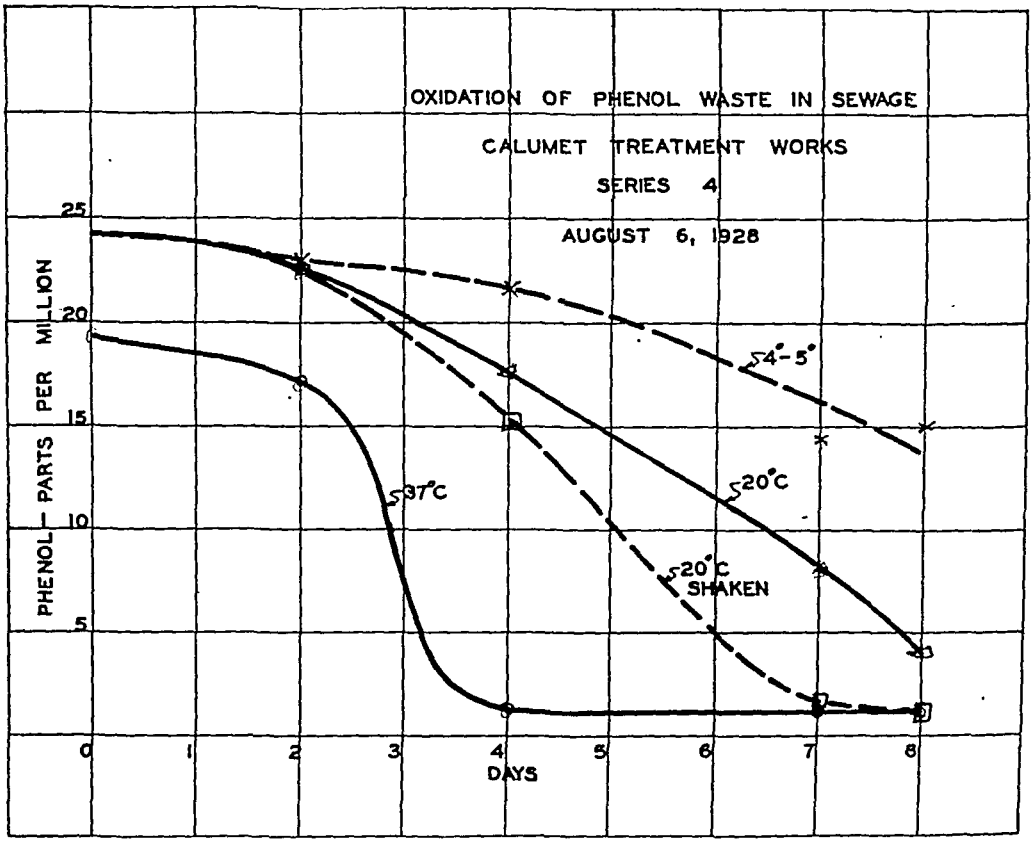


FIGURE II

EFFECT OF TEMPERATURE ON RATE OF BIOCHEMICAL OXIDATION OF PHENOLIC WASTES IN SEWAGE



with organisms which have been "activated" or adapted to the oxidation of phenol. In order to show the value of this procedure a laboratory experiment was made by E. Hurwitz and S. Grant as follows:

Ammonia-still wastes were added to a sample of settled sewage from Des Plaines Treatment Works to give a concentration of about 25 p.p.m. The sample was aerated and samples withdrawn at intervals for determination of phenol. When the phenol had almost disappeared (after about 17 hours) 1 part of the effluent and 9 parts of fresh settled sewage were mixed for one portion of the test; the other consisted of a control of the settled sewage. Ammonia-still wastes were added to both portions to give 22 or 23 p.p.m. phenol. Both portions were then aerated with the same rate of air, and samples withdrawn hourly for phenol determination. The results are shown in Figure I.

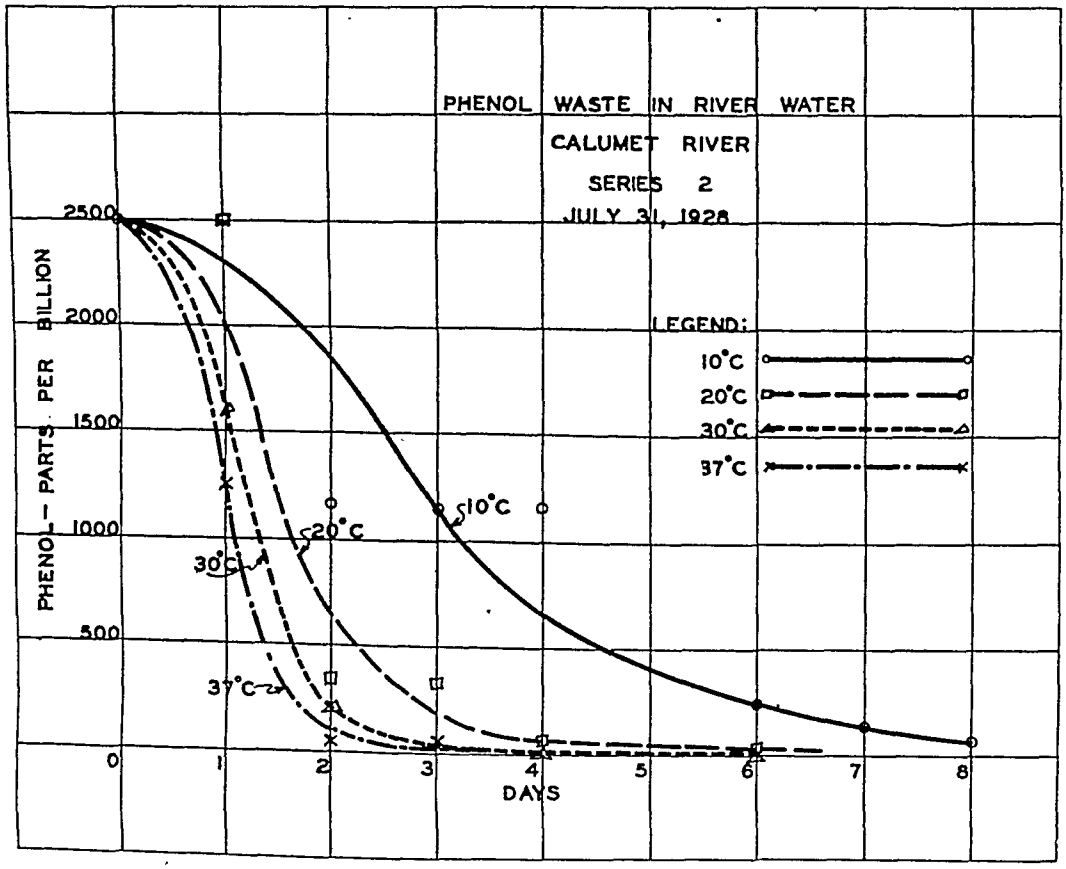
The oxidation of the phenol was markedly accelerated by the presence of the 10 per cent inoculum from the previous aeration. The time of oxidation was reduced from 15 hours to 9 hours.

EFFECT OF TEMPERATURE

It is reasonable to assume that, within the limits of temperature suitable for bacterial life, an increase of temperature will accelerate the rate of oxidation of phenolic wastes. In order to prove this assumption two temperature-rate experiments were run, one in the Calumet laboratory by J. R. Palmer and J. I. Smith, and the other in the main laboratory by G. P. Edwards. The results are shown in Figures II and III.

FIGURE III

EFFECT OF TEMPERATURE ON RATE OF BIOCHEMICAL OXIDATION OF PHENOLIC WASTES IN RIVER WATER



Calumet sewage to which 20 to 25 p.p.m. phenol in ammonia-still wastes had been added was used in the first experiment. The rate of oxidation was greatly accelerated at higher temperatures. Not enough points on the curves were determined to warrant an attempt to calculate a temperature coefficient for the reaction.

Calumet River water was used in the second experiment. The phenol content was brought up to 2,500 parts per billion (2.5 p.p.m.) by the addition of ammonia-still wastes. Samples were incubated at

10°, 20°, 30° and 37° C. The difference between the rates at 10° and 20° C. is particularly noteworthy. At 20° C. the phenol content decreased to 100 p.p.b. in 3.4 days, while at 10° C. it required 7.4 days for it to decrease to this amount.

This fact has considerable practical significance and importance. It furnishes one reason, probably the most important one, why chlorphenol tastes are more prevalent in winter than in summer. Far more phenol is oxidized in the warmer water and consequently less of it reaches intake cribs. Further development should be made of this fact in specific instances.

METHODS OF ANALYSIS

Two methods of analysis for phenol have been used in these studies. For amounts ranging from 2 to 500 p.p.m. phenol the titrimetric method was used, as worked out by Williams.[9] Minute amounts of phenol in river water, ranging from 0 to 2,500 parts per billion, have been determined by the Gibbs[10] method, as modified by Baylis.[11] This is a colorimetric method which depends upon the color produced by phenol and 2.6-dibromoquinonechloroimide. This method is more specific than the Folin-Dennis or the Fox and Gage methods, but requires careful technic.

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NOTE: The work reported in this paper was done at the main laboratory and the Calumet Treatment Works laboratory of the Sanitary District of Chicago. The writer is particularly indebted to J. R. Palmer, E. Hurwitz, G. P. Edwards and their assistants for experimental work and the analytical results.

DISCUSSION

WILLIAM A. RYAN

Sanitary Chemist, Department of Public Works, Rochester, N. Y.

THE chemical composition of ammonia-still waste from the plant of the Rochester Gas & Electric Corporation is approximately as follows:

	Grams per Liter		Grams per Liter
Phenols	2.15	Thio-cyanates	0.15
Cyanides	0.15	Ferro-cyanates	1.98
Sulphides	0.19	Thio-sulphates	7.40

The first Rochester investigation to determine the effect of ammonia-still waste upon sanitary sewage was carried on in the City Laboratory with the assistance of Mr. Shnidman, chemist of the Rochester Gas & Electric Corporation.

The results of this investigation, carried out on a laboratory scale, indicated that ammonia-still waste added to the sewage in the proportion of 1 to 1,000 effected no change in the alkalinity, pH value or biochemical oxygen demand, and had slight effect upon the number or character of the bacteria normally present in the sewage. Little or no absorption of phenol could be detected during passage through the Imhoff tanks in which the detention period was one or two hours. A slight absorption of phenol resulted after 5 hours' contact with sanitary sewage, and approximately 75 per cent of the phenol was destroyed after a contact period of 72 hours.

Before granting permission to the gas company to dispose of the still waste by discharging into the sewer rather than into the Genesee River, the City Council thought it advisable to carry on further investigations on a plant scale to ascertain the effect of waste upon the sludge in the Imhoff tanks. These tests were carried on at the Charlotte plant, which has a flow of approximately 500,000 gallons per day and a detention period of 4 hours in the Imhoff tank. For a period of 10 weeks ammonia-still waste was introduced at the rate of 1 part to 1,000 parts of sewage. Approximately 8 feet of digested and well digesting sludge was present in the sludge compartment of the tank at the time the test was begun.

Conclusions drawn from the 10 weeks of operation are as follows:

1. The sludge formed was well digested and drained, and dried well upon the sludge beds.

2. The results of chemical analyses of the treated sludge showed no radical change except in the phenol content, which gradually increased until it reached a maximum of 12 p.p.m.

3. There was an increase in the bacterial count and in the amount of gas produced. There were indications that the addition of small amounts of phenol helped rather than harmed the digestion of the sludge.

For a period of 3 weeks, following the 10 weeks' test, the ratio of still waste to raw sewage was maintained at 1 to 166. A poorly digested sludge resulted which did not dry well. The safe ratio for adding still waste to sewage appeared to lie somewhere between 1 to 1,000 and 1 to 166.

As a result of this investigation, the gas company was granted permission to discharge the wastes from the ammonia stills into the sewer. For a period of a year, 360 pounds of phenol were daily discharged into the sewer and passed through

the 10 Imhoff tanks at the Irondequoit plant without in any way affecting the digestion of the sludge. The mean daily flow at this plant is 47.7 million gallons.

During January, 1928, four tests were carried on at the Brighton Sewage Treatment plant. This plant has both Imhoff tanks and trickling filters. The results obtained were as follows:

TABLE I

	Phenol Content in p.p.m.			Per Cent	Minimum
	Raw Sewage	p.p.m. Phenol Added by NH_3 Still Waste	Final Effluent	Phenol Absorbed	Temperature Degrees F.
A. Normal Sewage*	3.6		2.0	42.9	41
B. Sewage Plus Ammonia-Still Waste					
1. Ratio 1–850	4.6	2.0	3.1	31.1	41
2. Ratio 1–420	8.2	6.1	4.7	42.7	40.5
3. Ratio 1–210	11.1	8.6	7.2	35.1	41

* Average of 8 tests

It will be noted from Table I that, even at a temperature of 41° F., decomposition of phenol is possible by means of certain types of aerobic bacteria plus the oxygen present in the beds.

During the spring of 1928, an Emscher contact aerator was built in the Imhoff tank under construction at the Brighton plant. The tank and aerator were placed in service August 1, 1928. This test was carried on without the addition of ammonia-still waste. Previous tests indicated that phenolic compounds are normally found in sanitary sewage. Phenol was determined by the Folin-Dennis method.

Table II shows the average results of 12 analyses:

TABLE II

Date Collected	Phenol Content in p.p.m. Raw Sewage	Emscher Contact Aerator Effluent	Trickling Filter Effluent
9–15	2.1	2.8	1.8
9–17	3.0	2.5	1.9
9–20	2.2	1.6	1.1
9–21	2.3	2.6	1.5
9–22	2.8	3.2	1.9
9–24	3.8	3.8	2.7
9–25	2.7	2.4	1.5
9–26	2.5	2.4	1.7
9–27	2.0	2.0	1.4
9–28	2.3	2.5	1.8
9–29	1.8	1.8	1.5
10–1	2.9	2.2	1.8
Mean	2.53	2.57	1.72

Removal in Emscher Aerator—None
Removal in Trickling Filter—32 per cent
The temperature of the various samples averaged 62° F.

The results of these tests, taken in conjunction with the ones carried on in January, 1928, prove that the oxidation of phenolic wastes is not a purely chemical oxidation but one that must be accomplished through the assistance of certain types of aerobic bacteria.

Extension of Industrial Hygiene by Tuberculosis Associations in the United States*

BERNARD S. COLEMAN

Executive Secretary, Hudson County Tuberculosis League, Jersey City, N. J.

THERE are two primary reasons for including industrial work in a tuberculosis program: first, that tuberculosis is basically a problem of the working man and woman, since one out of every three or four deaths between the ages of 15 and 45 occurs from tuberculosis and the peak of our death rate is in the period of our greatest productivity; and second, that tuberculosis associations can most easily reach the tuberculous by organization of working men and women in the industries, since here we have some 40 million people in groups of various sizes who are much more easily approached than they would be as individuals."

A recent survey of the industrial hygiene activities of tuberculosis associations in the United States reveals some rather interesting facts. The majority of the larger associations include industrial hygiene in their program—from health education by health talks, motion pictures and the distribution of health literature, to the actual operation and supervision of medical departments in industrial establishments. For years attempts at industrial hygiene programs had been made, but with few exceptions the associations were handicapped by lack of funds or lack of proper personnel to carry the work to completion.

The survey which included a study of 69 state and local tuberculosis associations showed 10 conducting physical examinations in industrial plants. In some cases these examinations have been the forerunners of industrial medical departments in the plants. Six associations have developed placement bureaus to assist patients discharged from sanatoriums in securing employment. Twenty-six are endeavoring to interest employers and employes in individual health, factory sanitation, and other factors pertaining to industrial hygiene, by means of pamphlets, literature and posters; and conducting health talks and motion pictures in the plant during the noon hour. Fifteen coöperate

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

TABLE I

EXTENT OF INDUSTRIAL PROGRAM OF TUBERCULOSIS ASSOCIATIONS IN THE UNITED STATES

State and Local Tuberculosis Associations	Physical Examinations of Employes	Health Education in Factories	Chest Clinics in Factories	Industrial Survey	Placement Bureau	Coöperate with Industries	Contemplate Industrial Program	Interested in Industrial Program	No Industrial Program Indicated
Alabama		x				x		x	
Arizona						x[1]			
Arkansas								x	x
California	x					x		x	
Colorado									x
Denver		x							
Connecticut								x	x
Hartford	x	x		x					
Delaware		x						x	
Georgia								x	x
Atlanta				x			x		
Illinois									x
Chicago[2]		x							
Indiana									x
Marion Co.[3]	x	x							
Iowa						x		x	
Kansas									x
Kentucky								x	x
Louisville	x	x							
Louisiana						x		x	
Maine						x			
Maryland									x
Massachusetts							x	x	x
Boston		x			x				
So. Middlesex				x		x		x	
Michigan								x	x
Wayne Co.		x			x				
Minnesota		x							
Hennepin Co.		x			x[4]				
Ramsey Co.		x			x				
St. Louis Co.		x							
Missouri								x	x
Kansas City				x			x	x	
St. Louis		x[5]							

with the industrial establishments in their communities by serving as clearing houses for information on all matters pertaining to industrial hygiene, and assist them in solving health problems which may arise. Thirty-six associations are contemplating a program of industrial hygiene; 10 have made a survey of the existing industrial medical facilities in the plants in their communities; 1 has a tuberculosis advisory service, and another operates chest clinics in factories.

That industrial health is a tuberculosis problem was forcefully brought out by E. R. Hayhurst, M.D., in 1925 in the paper which he presented before the National Tuberculosis Association:

TABLE I (*Continued*)

State and Local Tuberculosis Associations	Physical Examinations of Employes	Health Education in Factories	Chest Clinics in Factories	Industrial Survey	Placement Bureau	Coöperate with Industries	Contemplate Industrial Program	Interested in Industrial Program	No Industrial Program Indicated
Nebraska							x	x	x
Lincoln							x	x	x
Omaha							x	x	x
New Jersey[8]									
Hudson Co.	x	x		x	x	x			
Newark[3]	x	x		x	x	x			
Paterson[3]	x[9]	x		x		x			
Union Co.			x						
New York				x					
Brooklyn		x							
Buffalo		x							
New York City		x				x[6]			
Niagara		x							
Troy		x							
North Carolina									x
North Dakota									x
Ohio									x
Cincinnati		x							
Oregon		x				x	x		
Pennsylvania									x
Bethlehem	x	x				x			
Chester	x	x				x			
Erie	x	x		x		x			
Philadelphia	x[7]	x		x		x			
Scranton	x	x				x			
Rhode Island		x				x			
South Carolina						x			
South Dakota									x
Tennessee									x
Texas									x
Utah		x							
Vermont		x						x	
Virginia									x
Washington								x	x
Pierce Co.	x	x							
Wisconsin				x			x	x	

1. Assisted in engaging nurses for copper mining industry
2. Established and developed industrial service in 60 large industries in 1914
3. Nutrition classes in factories
4. Taken over by state tuberculosis association
5. Promotion of industrial medical departments in industry
6. Tuberculosis advisory service
7. Unit Plan
8. See under Newark
9. Evening clinics for labor unions

Tuberculosis exists to an unreasonable extent in the industrial group because of the ready lining up of a number of factors, such as unfit individuals for job placements, unfit jobs for individual placements, unfit surroundings for many jobs, unfit housing and recreational facilities in industrial communities, and unsupervised

sanitation and hygiene during the working hours. Industrial executives must believe in and patronize their own industrial medical services to beget the confidence of employes.

Dr. Hayhurst went further in voicing his belief that "Local tuberculosis societies might well take the leading part in stimulating the organization of medical and health supervision of industries and commercial establishments." Local, state, and county organizations are gradually awakening to their responsibilities along these lines and it is reasonable to assume that within the next decade a remarkable advance will have been made in the inclusion of industrial medical departments in plant management as a result of demonstrations conducted by the tuberculosis associations in various parts of the country.

That there was a large problem for tuberculosis associations to consider was evidenced in 1911 by the formation of the Committee on Factories of the Chicago Tuberculosis Institute, under the guidance of Dr. Theodore B. Sachs. A splendid program was developed, perhaps one of the most outstanding attempts at a comprehensive plan of industrial hygiene ever made in this country; it was carried along for 4 years and then unfortunately dropped. But in the meantime an excellent foundation had been laid for future industrial medical development in the plants in Chicago. The plan of this committee first laid emphasis on the search for tuberculosis among employes; but it soon became evident that the early detection of tuberculosis could best be accomplished through the general supervision of the employes' health, and thus it was concluded in the interest of economy that examination of employes for tuberculosis should be a part of a general industrial medical program.

Forty-one of the largest industrial concerns in Chicago and 14 social agencies coöperated with the committee; 24 conferences were held over a period of 4 years and at each meeting some important phase of industrial hygiene was discussed.

The committee's aim was:

> Toward detection and suppression of sources of infection in the working place; detection of cases of the disease in the curable stages; guidance of all employes predisposed to the disease and of those who are reëmployed after having recovered their health by sanatorium or home treatment; guidance of all employes in right living and methods of prevention.

It was considered the ultimate function of the Committee on Factories of the Chicago Tuberculosis Institute " to assist, whether by state insurance or other measures, in bringing about adequate protection for the employe, from sickness, invalidity, old age." Nor did the report fail to mention the extension and strengthening of employes' benefit associations and industrial insurance as well as the importance of " not relegating to the scrap heap " the physically handicapped.

As a result of the conferences held by the committee many of the larger firms adopted a program of medical supervision. At the beginning of the campaign there were 20,000 employes represented in the conferences; 30,000 were employed in plants where examinations were made of all suspicious cases of illness, but in none of them were examinations made of new employes. At the end of a 3-year period 187,100 were represented; 150,000 employes were in plants practicing examinations of all suspicious cases of illness; and there were 58,000 employed in plants requiring examination of all new employes. It had also been hoped to reach the smaller factories, but this was not accomplished during the 4-year period.

At about the same time that the Chicago plan was put into effect, other tuberculosis associations became interested in the fight against tuberculosis among working men's organizations in the United States, resulting in the formation of the Trades Union Section of the Buffalo Association for the Relief and Control of Tuberculosis and the Trades Union Anti-Tuberculosis Association of Newark. The latter is still active.

In a report published in 1916 by the National Association for the Study and Prevention of Tuberculosis, it was stated:

> The anti-tuberculosis society that fails to utilize the organized efforts of the workingmen is missing a real opportunity. No matter whether a community is strongly unionized or not, with a tactful approach and a proper plan, the men and women in the mills and factories can be turned into a mighty source of influence in their community, both for the good of the general public health and for the benefit of the individual personal hygiene of the workers themselves.

The report advocated periodic medical examinations to discover and control early cases of tuberculosis and other diseases and to provide for suitable employment of the convalescent worker. It directed attention to the responsibility of the tuberculosis associations in sponsoring a program of industrial hygiene.

During the last decade the most outstanding work in industrial medical development by tuberculosis societies has been that of the Philadelphia Tuberculosis and Health Council, under the leadership of Dr. Harvey Dee Brown. An industrial hygiene program has been sponsored and developed to demonstrate to industry the management and operation of the medical department in the plant proper and the advantages to be derived therefrom. The decision to include industrial hygiene in its program was inspired by Dr. Horwood's Tuberculosis Survey of Philadelphia in which he recommended that:

> . . . particular emphasis must be directed toward finding the early adult cases of tuberculosis, especially among those who are industrially employed, and to this end it is urged that . . . the anti-tuberculosis campaign be directly introduced

into the various industries, through the holding of clinics, the use of tuberculosis nurses, and the dissemination of knowledge concerning tuberculosis.

To the Philadelphia Tuberculosis and Health Council belongs the credit for showing other tuberculosis associations how the work can be done, and it is interesting to note that several are already following in the course outlined by the Council.

Beginning with noon-day talks, the distribution of posters and literature on health matters, and night clinics for industrial workers, a health examination service for employes of small plants was started. The interest of the employers was aroused and it was not very long before the service was being paid for by industry, whereas it had first been given by the Philadelphia Tuberculosis Council as a demonstration and without charge. With this development a survey was undertaken to determine how many plants in Philadelphia had medical service, and on the basis of this survey, which showed that the majority of the smaller plants had no medical service whatever, the Council undertook to present its Unit Plan for coöperative medical service among these plants.

In this plan units are made up of plants with less than 500 employes, reasonably near each other, and having a total of 1,000 employes for the unit. A full-time nurse and a part-time physician are necessary for each unit, and each plant sharing in the unit provides a clinic room at the plant. The cost for the maintenance of the unit is shared by the individual plants on a pro rata basis depending upon the number of employes. This amounts to $4.50 per employe per year. All organization and administration expenses, that is, cost of record forms, establishment of medical department, and organization of the work, are borne by the Health Council. Excellent results have been attained.

In 1927 the Council was successful in developing health work in 20 plants, in 4 of which the work was taken over and continued entirely by the plants. Industrial medical activity was supervised in 15 plants to the extent that the work can be taken over by the plants themselves whenever they are ready to do so. In Philadelphia 6,000 employes are now in plants in which there is medical supervision as a result of the efforts of the Council.

A report of the Council states that in 1927 there were 18,682 visits to plant dispensaries maintained under the Unit Plan. Of these 10,871 were for minor accidents and 7,811 for various slight accidents.

The Unit Plan includes a monthly health poster service, health classes among employes, advice on personal health problems, sanitary surveys and monthly sanitary inspection of the plant.

The Philadelphia experiment has led to the development of industrial hygiene programs in the activities of the tuberculosis associations of Paterson, Newark and Jersey City, N. J.; Erie, Chester, Bethlehem and Scranton, Pa.; Louisville, Ky.; and Indianapolis, Ind.

In Paterson, N. J., several plants have already taken over the work demonstrated by the Paterson Tuberculosis and Health League. Nutrition classes for underweight employes, in addition to the health examination service, and night clinics for labor unions have been established.

For the past 3 years the New Jersey Tuberculosis League has maintained an industrial health service intended to demonstrate to industry the importance of guarding the health of the worker, the value of periodic health examinations and the manner in which a program of medical supervision in the plant can be carried out systematically and efficiently. During this period 3,396 examinations were made in 30 plants in Newark. Sixty-four cases of tuberculosis were detected, of whom 27 were later admitted to sanatoriums, only to be returned to their jobs as arrested cases at the end of their stay. The examination service in Newark was intended to serve as the nucleus for the development of the Unit Plan.

The Hudson County (N. J.) Tuberculosis League has only recently started its health service for industry, and is patterning its program according to the Philadelphia plan, with slight modifications. A survey of industrial medical facilities in the county has been made and it shows a general lack of direct medical supervision in the industries, especially in those employing less than 1,000 employes. Here, as also in Newark, Paterson and Philadelphia, a demonstration of the physical examination of the employe will be made before the Unit Plan in part or in its entirety is offered to the plants. Great stress is being laid upon the physical examination of the applicant prior to placement; periodic examinations of all employes every year, except where otherwise indicated; "fitting the individual to the job"; the care and cleanliness of wash rooms, locker rooms, rest rooms and toilets; and proper illumination and ventilation in the plant. An effort is being made in the follow-up of all employes examined to have them correct their physical defects. In case of inability to pay for medical treatment the employes are directed to the clinics in the county. The follow-up work is considered one of the strongest points of the entire program, for by interesting the individual in his own physical condition it is hoped to further interest him in the betterment of conditions at the plant from the standpoint of hygiene and sanitation.

The Hudson County Tuberculosis League, in conjunction with the

Hudson County Safety Council, is planning a series of lectures on industrial hygiene to plant executives and foremen. These will include the health of the worker and sanitation of the plant. Matters pertaining to compensation for industrial accidents and diseases, and the medico-legal aspects of the latter will be discussed.

In Erie, Pa., a survey has been made, the demonstration of examinations is being carried out, and it is planned to develop the Unit Plan. The Erie Anti-Tuberculosis Society believes that under proper supervision, "it should be one of the most important services that a tuberculosis association can do for an industrial community." The interest and coöperation of the Erie Manufacturers' Association and the Erie Safety Council have been secured.

The New York Tuberculosis and Health Association maintains a Tuberculosis Advisory Service for the purpose of assisting industrial physicians and personnel directors with problems pertaining to the early diagnosis of tuberculosis and the placement of patients in different stages of the disease. The service was organized "at the suggestion of some of the well known industrial physicians who now make use of it and consider it part of their respective organizations, and is designed to assist in the care of such patients as are reluctant to consult a specialist because of the cost, yet whose position is such that they are unwilling to accept free care." Some of the largest industrial organizations in New York City are subscribers to this service.

In 1926 an industrial survey of Hartford, Conn., was made by the Hartford Tuberculosis and Public Health Society. It was conducted in 39 factories employing 25 or more persons each and covered a total number of 18,875 employes. The majority of the plants were members of the Hartford Manufacturers and Employers Association. As a result of the survey it was concluded that "the development of medical service is more practicable in the larger plants than in those employing fewer numbers, but that a joint plan of medical service could be adopted in a group of smaller plants."

The Marion County (Ind.) Tuberculosis Association has "extended its health efforts into Indianapolis industries with the hope of interesting employers in increased efficiency in industry through the systematic health supervision of employes," and has conducted physical examination campaigns and developed adult nutrition classes.

A county industrial health program has been developed by the Tuberculosis Society of Detroit and Wayne County, Mich., but it has not included the development of an intensive medical service in factories. The society acts as a clearing house for the tuberculosis problems arising in factories; it has an extensive program of health edu-

cation for industry; and maintains an employment service for arrested cases of tuberculosis.

In carrying on the fight against tuberculosis in industry many problems are presented pertaining to the health of the individual and of the public in general, and the physical examination clinic, sponsored by the majority of tuberculosis associations in the United States, can become the nucleus of an extensive industrial medical department.

CONCLUSION

This paper has purposely omitted a discussion of placement services, rehabilitation work, and the various types of educational work performed by the tuberculosis associations. It has aimed rather to summarize in a general way the extent to which industrial hygiene activities are being included in their programs. Considering the interest and work undertaken during the past few years it is reasonable to assume that definite progress, although slow, is being made in the extension of industrial hygiene by tuberculosis associations in the United States.

Many of the tuberculosis organizations studied in the survey are making an attempt to interest industrial executives in the advantages that may be derived from industrial medical service in the plant, and to date there have been many instances of success as a result of these endeavors.

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A Series of Typhoid Fever Cases Infected per Rectum*

C. R. HERVEY, M. D., FELLOW A. P. H. A.

District State Health Officer, Oswego, N. Y.

DURING January and February, 1928, 13 cases of typhoid fever occurred in a group of surgical patients in a general hospital of 118 beds.

Transmission of the disease is attributed to the practice of using the same Harris drip apparatus interchangeably between patients without sterilization. The Harris drip apparatus consists of a container for fluid, and a rubber rectal tube. Unlike the Murphy drip, the Harris drip container is placed at the side of the patient at the level of the abdomen, and the fluid allowed to flow under very low pressure. As there are no check valves the containers are subject to gross contamination when a reverse flow occurs during vomiting, straining, or the advance of gas or feces in the bowel. At the time of the outbreak it had been the procedure to sterilize the tubing, but the containers were rinsed in tap water only.

The outbreak was explosive, or at least semi-explosive in character, all the cases occurring in a period of a little over 3 weeks. The age incidence ranged from 8 to 79 years, though only 3 of the cases were under 25 years of age.

With one exception the cases were confined to the second floor of the hospital, consisting of 17 rooms and a small ward of 4 beds. Four of the rooms contained 2 beds each, which were occupied at the time in question. In 9 of the rooms on this floor, and in 1 room on the first floor, typhoid cases occurred.

The onset of the first case was probably January 24, but the presence of typhoid was not suspected until February 5, when the third case in the series died, and an autopsy showed typhoid lesions. Following this, typhoid was demonstrated in all cases by laboratory tests of blood, urine, and stools.

All the cases had been on the Harris drip and, with one exception, occurred after surgical operations. The exception was a patient with carcinoma, who received the drip as a sustaining measure.

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* Read at a Special Session on Epidemiology of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

The drip containers were not suspected until February 13, by which time 9 cases had developed. They were sterilized on this date. The onset of the last case was 6 days later, on February 19.

No one in the hospital developed typhoid who had not received the drip from the apparatus on the second floor.

Incubation periods were, as nearly as could be determined, as follows: 4 days in 3 cases, 6 days in 2, 7 days in 3, 8 days in 2, and 9 days in 3. The average period was between 6 and 7 days.

This is about one-half to one-third the usual incubation period in typhoid by infection by mouth, though incubation periods as short as 2 and 3 days have been ascribed to cases so infected.

Figure I shows the temperature curves from the first drip administrations to the rises indicative of the onsets. These were all major operative cases, and postoperative temperatures frequently occurred. But the rises of temperature on the dates of ascribed onset were usually so sharp, and the symptoms of the patients were so severe, that they seem quite certainly to indicate a superimposed infection. No infection of a surgical nature could be found and it seems fair to ascribe them to the typhoid fever. The onsets were usually initiated by chills, and the temperature rose almost to maximum height within the first 24 hours in the majority of cases.

Contact between cases other than by the drip medium; contact with a carrier or carriers among nurses, or other employes; infection outside the hospital, excepting in case 1; and food or water infection; seem to be satisfactorily excluded by the following considerations:

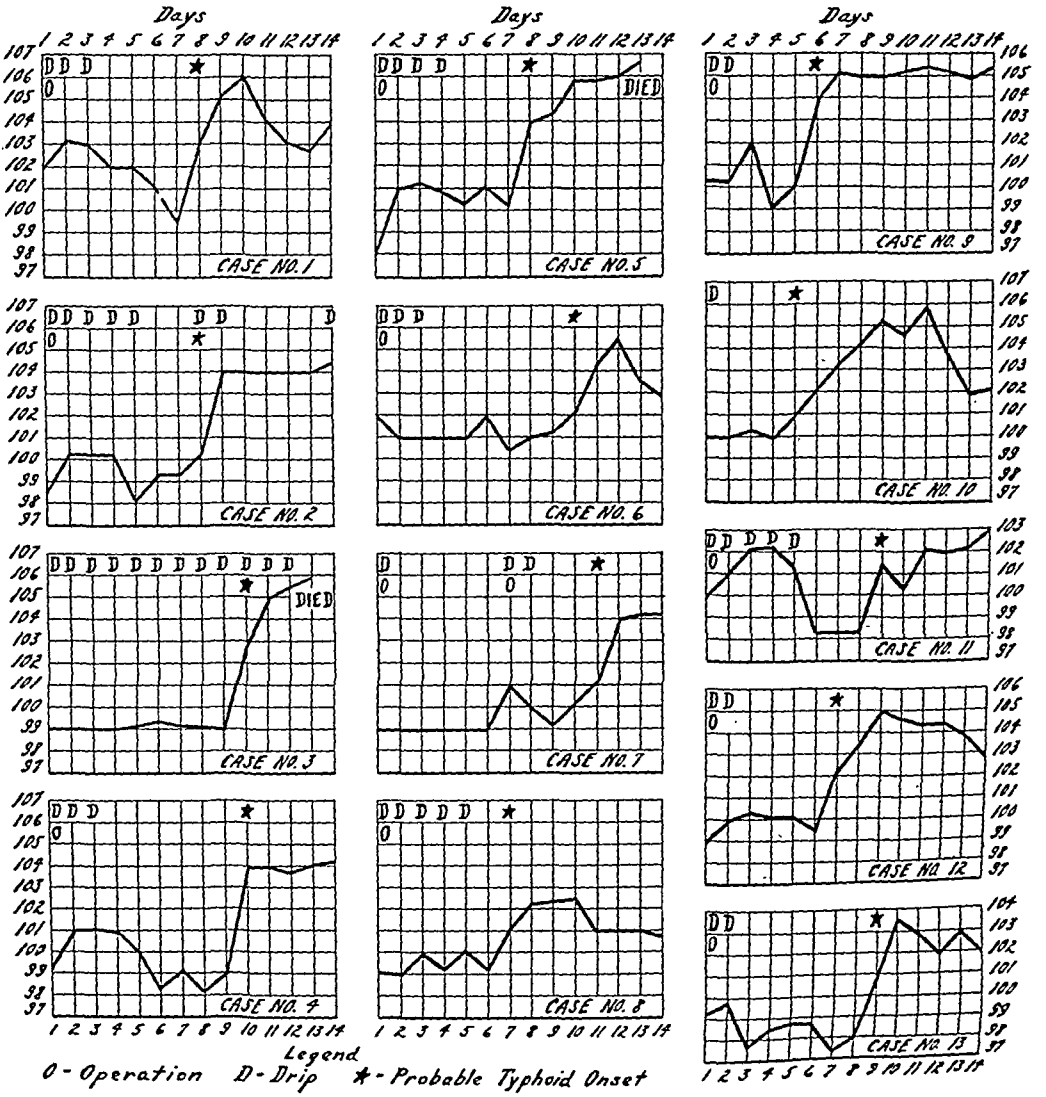
Contact between Typhoid Cases—Opportunity for contact infection might seem to have existed in the 4 rooms having 2 beds each. Two of these were occupied by male, and the other 2 by female patients. We will consider the rooms severally as numbered, 1, 2, 3, and 4.

Room 1—A medical case occupied this room with case 1 from January 10 to January 28; that is, during the incubation period, and for 4 days after the onset. He did not have the drip, and did not contract typhoid.

Case 8 also occupied this room while case 1 was in the height of his fever, from February 5 to February 9. He was administered the drip on each of these days, and developed typhoid on February 12, 7 days after the first drip. This patient was 79 years of age and was operated upon immediately after admission for ruptured appendix. The chance of infection by mouth cannot be certainly ruled out, but when the age and the diet of such a case are considered, the chance seems very remote.

Room 2—Case 4 occupied this room for 4 days after receiving the drip, but was removed therefrom on February 2, 5 days preceding her attack. Case 6 was here with case 4 only over the night of February 1. Case 6 had the drip on February 2, 3 and 4. Her attack occurred on February 12. Case 13 occupied room

FIGURE I—Excerpts from Temperature Charts of Typhoid Patients, Showing Relation of Incubation Periods to Harris Drip



2 with case 6 from February 10 to 14, 2 days before and 2 days after the onset of case 6. She had the drip on February 11 and 12. Her attack occurred 8 days after the first administration.

Room 3—A medical case occupied room 3 with case 11, during his incubation period, and for the first day of his attack. He did not have a drip and was not infected.

Room 4—A medical case occupied room 4 with case 2 during the incubation period, and for 8 days after the onset of attack. She did not have the drip, and did not contract typhoid.

Only 3 of the 13 cases occupied rooms with cases having earlier onsets. Thus, of the 6 room contacts, the 3 without drips did not contract typhoid; whereas, the 3 having the drips did. There seems little, therefore, on which to base a theory of

infection by contact other than the drip. Furthermore, 4 medical cases in an adjacent ward, and 4 in contiguous private rooms, under conditions apparently identical, but who did not have the drip, did not contract typhoid.

A Carrier among Nurses or Other Employes—A search was made for a carrier among nurses and employes who might have infected the drip containers, or the food supply. Blood, urine and fecal specimens from each nurse in the institution, and from all inside employes, were found negative. The patients affected were served by 18 special nurses, who did not interchange services between rooms.

Infection Outside the Hospital—Eight of the 13 cases came to the hospital from widely separated communities in which no known typhoid had existed for months, and in some instances for years. Five were from the city, where typhoid occasionally occurs but where no known typhoid had occurred for several weeks. There is no reason to suspect any excepting the first case of being in the incubation period on entrance. It would be absurd to postulate that each of these individuals contracted typhoid outside, and came together to develop it on the second floor of this hospital.

Food and Water—Food for the patients and employes was prepared in the general kitchen in the basement of the main building. For private room patients it was served on dishes in the central diet kitchen, taken to the various floors, and distributed by the nurses to their charges. Food for the ward patients was taken in bulk to the several ward diet kitchens where it was placed on dishes, and distributed. The same food supply served the whole institution, the only difference being in the method of distribution.

Milk used was from a pasteurized supply, from a dairy furnishing 34 per cent of the milk of the city. It was conveyed to the hospital in 25-gallon cans and served to the floors in pitchers and jugs. Water was from the city supply, which was chlorinated, filtered, and under competent supervision at all times.

The absence of typhoid at this time in the city, and among other patients in the institution, would exempt both the milk and water from suspicion.

A persistent attempt was made to discover the identity of any individual, other than case 1, who might have infected the first container. In this pursuit specimens of urine, blood and feces of all patients, with one exception, on the second floor, who had received the drip within 25 days preceding the onset of the first case, were examined and found negative. The exception was a person who had left the locality without known address, but the hospital records show that this patient had not had typhoid fever.

Case 11 furnishes additional evidence against the Harris drip container. This patient was taken to a private room on the first floor after a cholecystectomy. A drip apparatus, taken from case 5, was used on February 7, 8, 9 and 10. The last use of the apparatus by case 5 was on February 5. This case was then in the 4th day of his 7-day incubation period. Nine days later the onset occurred in case 11.

The significant sequence of events determining this outbreak seems to us to be as follows: Between January 10, the date of admission of the patient first to develop typhoid, and until they were sterilized, 7 apparatuses were used on this floor in the treatment of 20 cases. It was a common procedure to retain the apparatus in a room until drips were discontinued, but as no rule existed to the contrary, they were sometimes interchanged between rooms, or taken to the floor wash-room, tubes boiled, containers rinsed, and left, unless the patient was to continue the treatment.

Figure II shows the date of admission of every patient receiving the Harris drip between December 30 and February 13. It also shows

FIGURE II—Patients in Surgical Group, Arranged according to Date of Admission

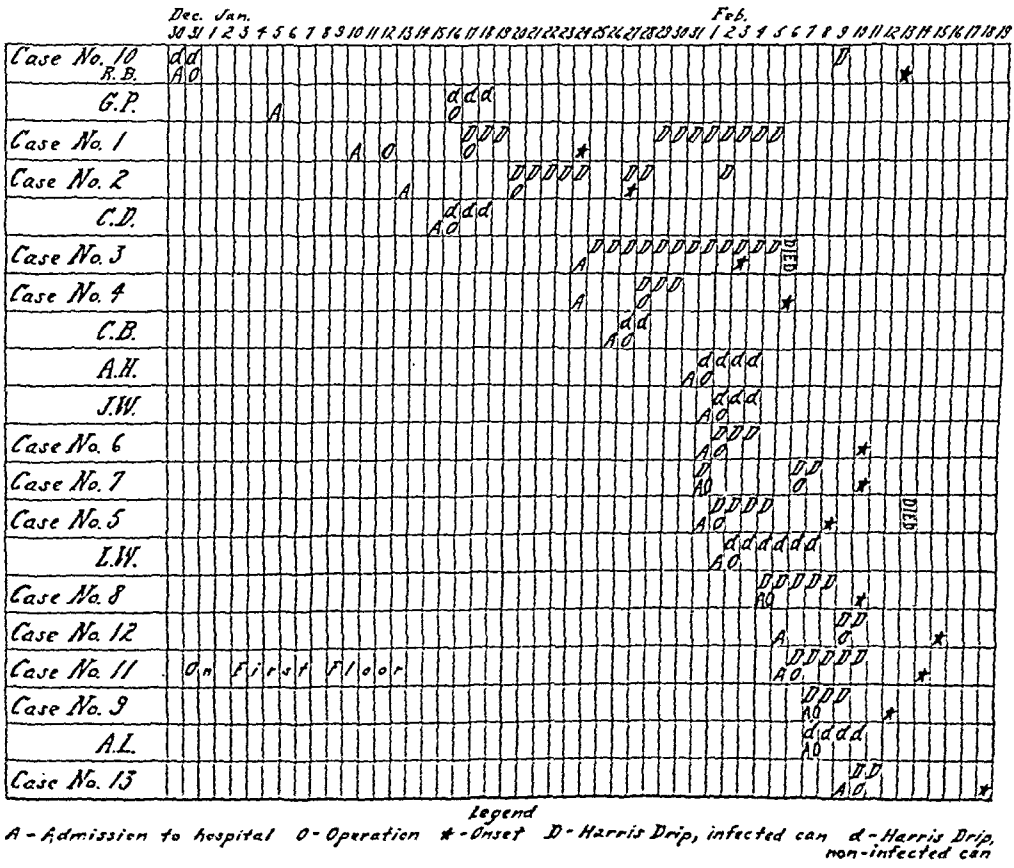
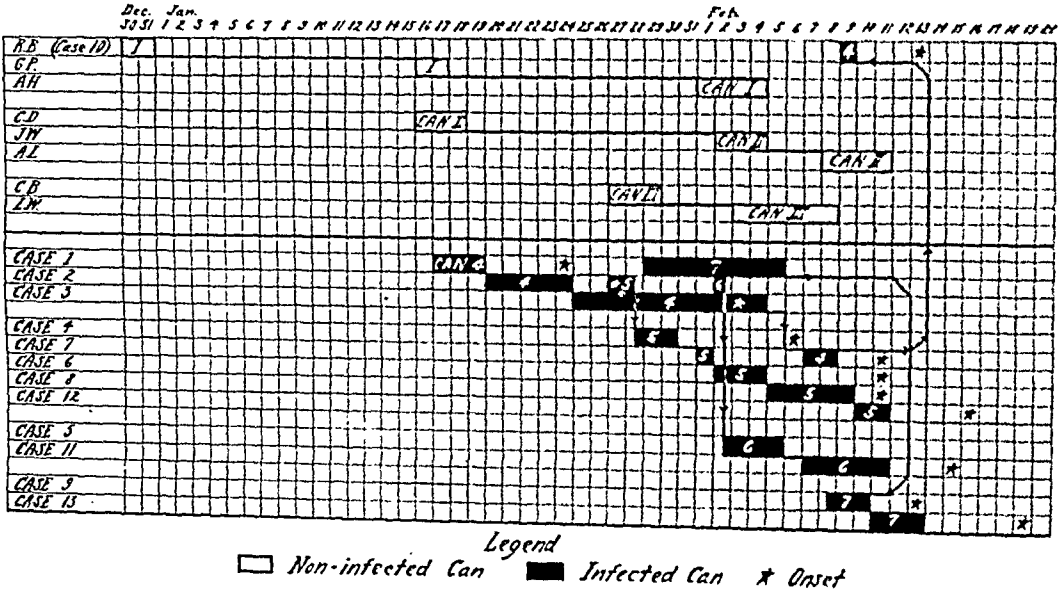


FIGURE III—Sequence of Events



the date of operation, the dates on which the drip was used and the dates of onset in those who contracted typhoid.

Drips which did not apparently result in infection are designated by a small "d," those which did, by a large "D." From this chart, we have been able to deduce a sequence of events graphically shown in Figure III, which would account for all of the infections having come from case 1, and at the same time account for the escape of the 7 unaffected individuals.

SUMMARY AND CONCLUSION

Thirteen cases of typhoid fever occurring in a hospital of 118 beds were all among a group of 20 surgical patients, to each of whom a rectal drip had been administered.

Gross pollution of drip apparatus occurred regularly when in use.

After use the containers were rinsed but not sterilized.

Other routes of infection have been excluded beyond reasonable doubt.

Case 1 developed typhoid on the 14th day after admission to the hospital and it is not unreasonable to postulate that he was infected before admission. No other sources of infection were found on laboratory examinations of the excreta and blood of other patients, attendants, etc.

In the instance of case 11, an apparatus known to have been taken directly from case 5 was used and typhoid developed 8 days later.

A hypothetical sequence in the exchange of apparatus, compatible with known facts, has been shown, which would account for the entire epidemic.

Failure of Standard Method for Visible Dirt in Milk to Meet Connecticut Requirements*

FRIEND LEE MICKLE, M. S., FELLOW A. P. H. A.

Director, Bureau of Laboratories, Connecticut State Department of Health, Hartford, Conn.

THE third, fourth and fifth editions of *Standard Methods of Milk Analysis*[1] have contained not only directions for making the test for visible dirt in milk essentially as previously described by Schroeder,[2] but have included as well the standards for grading and reporting suggested by that author. The Connecticut modification of the test, published by Mickle,[3, 4] was adopted by the approved milk laboratories of that state because the technic in *Standard Methods* was too ambiguously worded to result in uniform findings in the various laboratories. The modification has found favor with laboratory workers, but its use has demonstrated the need in Connecticut for new standards for grading all milk samples. Particularly have the present standards been shown to be unadapted for use on milk as delivered to the consumer. This has resulted because milk that would have been accepted as clean when the present standards were originally developed would today be considered dirty milk with the present methods of clarification.

The results of 6 months' experience in the use of the Connecticut modification are given in Tables I and II to call attention that, although the standards are easily used in the laboratory, the results reveal a need for changing the value of the descriptive terms used jointly in the *Standard Methods* and the Connecticut modification so that, for example, milk containing as much visible sediment as represented by 1.25 mg. per pint will no longer be classed as clean milk.

Table I summarizes the results of 6 months' testing of all samples of bottled and bulk milk received at the Bureau of Laboratories of the Connecticut State Department of Health. Out of a total of 2,331 samples tested, 2,193 (94.1 per cent) were graded as showing less

* Read at a Joint Session of the Laboratory and the Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

TABLE I

RESULTS FROM 6 MONTHS' USE OF CONNECTICUT MODIFICATION OF MILK SEDIMENT TEST BY STATE DEPARTMENT OF HEALTH

Milligrams per Pint	Percentages[1]	Samples Tested	Percentages[2]	Cleanliness Ratings[2]
0.00	94.1	541	61.5	Clean and Fairly Clean
0.25		886		
0.50		505	21.5	Acceptable
0.75		157	14.5	Dirty
1.00		104		
1.25	5.9	79		
2.50		47	2.5	Very Dirty
3.75		10		
5.00		2		
Total	100	2,331	100	

1. Of all samples of bottled and bulk milk tested, 94.1 per cent fell inside limits of Connecticut standard; 5.9 per cent fell outside and were graded according to standard method.
2. The right hand two columns show approximately how samples would have been graded by author's suggested "Cleanliness Ratings," with the new values suggested by the author for the descriptive terms.

than 1.25 mg. of dirt per pt. All these were graded as "clean" under the standard method but by the procedure suggested in this paper only 23.5 per cent of the total would have been grouped as "clean" while 38.0 per cent would have fallen in the class of "fairly clean," 21.5 per cent in the class of "acceptable," and the balance would have been considered as "dirty." The latter grouping far better meets the need of the enforcement official.

In Table II is presented a summary of the results secured by the New Haven City Health Department* over a period of nearly 6 months. These examinations were all made on pint samples. The director of that laboratory has informed the writer that he has found the method in the fifth edition of *Standard Methods* "cannot be applied to the general run of samples of New Haven milk unless every sample is called clean, but that the method as modified by the Milk Laboratory Workers Association of Connecticut and adopted by that organization for all Connecticut approved laboratories, at a meeting

* Results obtained in the Bureau of Laboratories of the New Haven Health Department were furnished by P. E. Bransfield, Director. They have been arranged in tabular form to make them conform with Table I and to illustrate how they would have been graded by the author's suggested classification.

TABLE II

RESULTS FROM NEARLY 6 MONTHS' USE OF CONNECTICUT MODIFICATION OF MILK SEDIMENT TEST BY NEW HAVEN DEPARTMENT OF HEALTH

Milligrams per Pint	Percentages[1]	Samples Tested	Percentages[2]	Cleanliness Ratings[2]
0.00	99.8	526	97.2	Clean and Fairly Clean
0.25		96		
0.50		12	1.8	Acceptable
0.75		5	0.8	Dirty
1.00				
1.25	0.2			
2.50			0.2	Very Dirty
3.75		1*		
5.00				
Total	100	640	100	

1. All the samples included in this table were pint samples of bottled milk. Of these, 99.8 per cent fell within limits of Connecticut standard; 0.2 per cent fell outside and were graded according to standard method.
2. The right hand two columns show approximately how samples would have been graded by author's suggested "Cleanliness Ratings," with the new values suggested by the author for the descriptive terms.
* "The indications are that the dirt in this sample of milk came from a dirty bottle, which for some reason escaped being washed, rather than that the dirt was in the milk itself. In my opinion, this one sample should be considered an accident."—Excerpt from letter from P. E. Bransfield, who furnished these data.

held in Hartford on January 9, 1928, is quite satisfactory for milk sold in New Haven," and adds that from the results obtained "it would seem that the A. P. H. A. Standards could be applied only to can or bulk milk in New Haven."

Connecticut officials charged with enforcing regulatory measures have been outspoken against the laboratories, following the standard method, having to class as "clean," milk that in this section of the country is considered dirty. Much of the value of the test as used in Connecticut has been educational in the way of elimination of sediment from milk as sold, by repeatedly impressing on the producer the desirability of marketing a milk a little cleaner than his competitor's. Granted that many times a "cleaned," rather than a "clean" milk undoubtedly reaches the housewife, the use of the test has surely been a factor, coupled with intelligent inspection and modern competition, in enormously reducing the visible dirt in market milk. To grade as "clean" samples showing 1.00, or as "fairly clean" samples showing 1.25 mg. of sediment per pt., if from milk as offered in trade today, would seem to be inconsistent with modern health education and

propaganda. For the purposes of the enforcement official it does not remedy the matter greatly to state on the report: "Where bottled milk is examined it should not show even 1.25 mg. of sediment per pt." if the sample is graded as "clean" or "fairly clean." Connecticut milk can scarcely be so much cleaner than that in other states that similar conditions do not prevail elsewhere. The undesirability of one state adopting a standard at variance with that in use elsewhere is evident in view of the frequency of milk surveys comparing results secured over broad areas.

As a result of his experience with the test, the author suggests the following changes in the standard method, and in the Connecticut modification as well, wholly in a spirit of constructive criticism with full realization that the committees on standard methods have never recommended the test for grading market milk samples at city and state laboratories in milk control work. On the other hand, it is believed the test should be as extensively used for that purpose as for grading milk at milk receiving stations and, accordingly, that it should be modified to more satisfactorily meet that need although it should not fail to meet as well the requirements for the rapid testing necessary at the receiving plant.

SUGGESTED CHANGES

1. *Size of Sample*—Pint samples should be continued as standard. Where larger samples either of bottled or bulk milk are received they should be thoroughly mixed and only 1 pint filtered. Where less than 1 pint of sample is examined the disc obtained should be graded directly against the photographic standard described below and the numerical result proportioned to a pint basis and then, but not until then, the accompanying descriptive term applied. This is desirable because, otherwise, if samples of various sizes are reported on one report, the results may be misleading. The size of sample should always be stated on the report when it is less than a pint. To state the size without making the calculation does not suffice because the result is expressed on the basis of the number of milligrams in a pint.

2. *Specifications for Testing Equipment*—It is rather desirable that the same type of tester be used in different laboratories, particularly as the discs furnished with the different testers may vary decidedly in thickness, texture and density. Specifications for a satisfactory testing device and for the cotton pads might well be incorporated in the method.

3. *Photographic Standard*—In Connecticut experience there has been far greater disagreement when individual laboratories attempted to prepare standard gauges by adding dirt to milk according to published directions than when a central agency prepared such a standard, photographed it, and distributed photographs to the laboratories to use as standards in grading the sediment obtained from filtering milk samples. It is very necessary that care be taken in eliminating shadows when making the negative of the photographic standard if prints are to be uniform. The prints distributed to laboratories to use as standards should be printed in large

numbers at a time on a photographic paper found by trial to be adapted to the purpose, and the light used and length of exposure should be such that conditions can be closely reproduced later. Several photographs purposely printed for different lengths of time were found to give comparable results in grading, however, when the precaution had been taken to eliminate shadows in making the original negative.

Grading should in no case be done against a reproduction from a printer's cut such as has been reproduced in *Standard Methods*. It is customary and almost a necessity in some laboratories where a large amount of grading is done to protect the photographic standard by framing it under glass. The author has not been able to see any objection to one laboratory using a framed and another an unframed photograph but the desirability of this practice might be considered.

The use of carbon of suitable density and proper size of particles, as has been suggested by Harding[6] (1928) and others, may be an improvement later but is not considered necessary for a usable photographic standard. It is understood that a committee of the International Association of Dairy and Milk Inspectors is investigating the possibilities of different grades of carbon as this is written. The suggestion has recently been made to the author that other substances, for example, manganese dioxide (pyrolusite), might be even better adapted to the purpose and it is hoped this material can be given a trial in the near future.

In preparing the standard discs for photographing, a "standard" dirt should be secured in quantity by the committee. A mixture of stable dirt from several sources has proved satisfactory for the purpose providing its density is increased slightly, if necessary, by the addition of a small amount of finely ground sand or similar material before the weighings are made. The stable dirt most comparable with that obtained from market milk in Connecticut was that which passed a 100-mesh sieve. The size of the sand particles should be slightly smaller than that of the dirt particles to render them unnoticeable.

4. *Discs Not to be Kept on File*—The entire disc should preferably in all cases be returned to the dairyman, health or dairy official or milk inspector with the report, and preferably attached to it. The record of the "sediment score" and "cleanliness rating" kept at the laboratory should be sufficient for record purposes in any case. In some instances it is difficult to cut discs into two portions showing equal amounts of dirt.

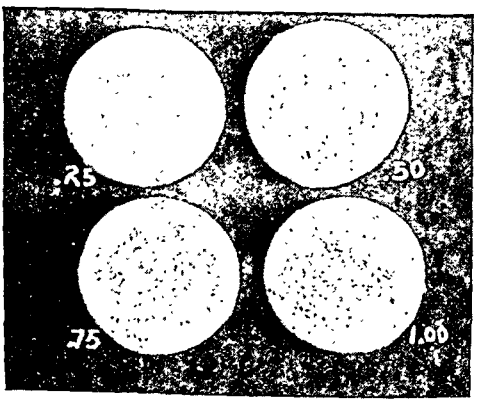


FIGURE I—CONNECTICUT SEDIMENT STANDARDS ADOPTED AT CONFERENCE OF CONNECTICUT APPROVED LABORATORY WORKERS ON JANUARY 9, 1928.

5. *Grading Large Sediment Particles*—No attempt should be made to grade as sediment any hair, piece of hay or straw or large particle of dirt. The finer dirt on the disc should be compared with the standard and reported as usual and then the report should state that sediment disc showed this material in addition.

6. *Additional Standard Gauges*—A large proportion of the specimens of milk examined in laboratories maintained by the cities and the state in Connecticut for control purposes are samples of bottled milk just as sold to consumers or of milk sampled from cans as delivered to schools, institutions or eating places. Figures given below demonstrate that very few of

these show as much sediment as that on the disc representing 1.00 mg. per pt. Since that is true, additional standards (Figure I) are recommended for use on milk as sold to the consumer, representing, respectively, 0.25, 0.50, 0.75 and 1.00 mg. per pt. Otherwise nearly all the samples examined will be placed in the one grade of "clean" and the work of making the test nullified. That these amounts have proved suitable for the purpose is shown in Tables I and II and in the discussion of the tabulated results.

7. *Descriptive Terms in Standard Methods Should be Changed*—The gauges pictured in the fifth edition of *Standard Methods* appear to be very usable at the farm and the receiving plant but the descriptive terms are not very apt for use on bottled milk and should be changed. Attention is called to the undesirability of having two sets of standards if that can be avoided, for many times on one report there may be tabulated a set of samples with some representing bottled or market milk and others representing samples collected at the farm or the milk plant. The author sees that occur almost daily. It would appear to be so unfortunate to have to mark one sediment disc attached to the report as "slightly dirty" and a dirtier one "clean," because two differing standards were being used, that the writer suggests the same gradings for all milk samples. It would seem desirable that standards be continued as a part of the printed method to discourage the upgrowth of a variety of standards in other ways and through other organizations.

8. *Terms for Reporting*—The term "milligrams per pint" is not strictly accurate since only a visual comparison of the obtained sediment is made with another "standard" sediment without taking into account the differences in density. That is the case whether or not the actual gauges or photographic standards are used for grading. Furthermore the term is cumbersome and not easily understood by many enforcement officials and dairymen. It is suggested the term "milligrams per pint" be abandoned in favor of an arbitrary standard in which the milligrams or fraction of a milligram of dirt in each instance would be multiplied by 100 to give for the eight standard gauges the corresponding eight whole numbers: 0, 25, 50, 75, 100, 125, 250 and 500, to be known as a "sediment score." Milk samples would then be graded as in Table III.

TABLE III

CHART FOR GRADING VISIBLE SEDIMENT IN MILK ACCORDING TO AUTHOR'S SUGGESTED METHOD

Terms Not to be Reported	Terms to be Reported	
Milligrams per Pint	Sediment Score	Cleanliness Ratings
.00–0.12	0	Clean
.13–0.37	25	Fairly Clean
.38–0.62	50	Acceptable
.63–0.87	75	Slightly Dirty
.88–1.12	100	Dirty
1.13–1.77	125	Very Dirty
1.78–3.75	250	Very Dirty
3.76–5.00+	500	Very Dirty

It is suggested that no "sediment score" be reported within closer limits than the eight units listed.

Results of any milk sediment test for visible dirt should always be reported both in terms of the "sediment score" and also by one of the descriptive terms for

"*cleanliness rating.*" It is possible that other descriptive terms than "clean" and "dirty" may be found preferable to those terms.

SUMMARY

The standard method for visible dirt in milk and the modification adopted for Connecticut approved health laboratories and recently published by the author are discussed. Results justify the modification for Connecticut market milk but suggest new terms for reporting. A universally adopted photographic standard distributed by the Committee on Standard Methods is urged in place of standards made by individual laboratories. Because the method aims at determining amount and not color of dirt a photographic standard should be applicable in any locality regardless of color of local soil. Connecticut experience demonstrates that satisfactory photographic standards can be prepared from discs with weighed amounts of stable dirt of proper specific gravity if shadows are eliminated in photographing. A standard carbon in place of stable dirt is not necessary, although its adoption later might improve the photographic standards. The term "milligrams per pint" is not readily understandable and is inaccurate; so photographic discs should be assigned arbitrary numerical values to be reported always together with corresponding descriptive terms.

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Women and Children in Industry

THE medical inspectors of factories in the duchy of Baden, Germany, have completed an investigation in an industrial and a rural district to determine the effect of factory and of farm work on the health of women workers and of children. Most of the industrial workers were employed in textile factories. In the course of the study the investigators interviewed women workers and their employers.

In both the industrial and the rural regions the average mortality rate for 1920–1926 for women of wage earning ages was higher than the rate for men of the same ages, apparently on account of the excessive fatigue caused by the double duty of wage earning and housekeeping. The factory work itself did not seem to have a bad effect on the health of the women workers.—*Reichsarbeitsblatt*, Berlin, Nos. 17 and 20, 1928.

Effect of Calmette's BCG Vaccine on Experimental Animals*

MERRILL J. KING, M. D., AND WILLIAM H. PARK, M. D.,
FELLOW A. P. H. A.

Hegeman Memorial Research Laboratory, Metropolitan Life Insurance Company Sanatorium, Mount McGregor, N. Y.; and the Bureau of Laboratories, Department of Health, New York, N. Y.

MANY methods of prophylactic immunization against tuberculosis have been recommended and attempted by such men as Koch, Pasteur, Baldwin, Theobald Smith, Trudeau, Pearson and Gilliland, Von Behring and others. During the past few years considerable publicity has been given the BCG vaccine of Calmette and some difference of opinion has been reflected in the literature regarding the efficacy of this vaccine, and especially regarding the danger that may be connected with its use in infants.

The *Bacillus Calmette-Guérin,* which is the so-called BCG, was isolated from a heifer in 1908 by Calmette and his associates. They determined it to be the bovine type of tubercle bacillus and to possess moderate virulence for guinea pigs, rabbits and cattle. Continuous cultivation over a period of years on glycerinated ox-bile potato medium reduced the virulence of the organism so that it will now produce only small localized tubercles which heal within a few months. They further state that it is able to produce skin hypersensitiveness and immunity against infection with virulent tubercle bacilli.

Calmette first recommended that new-born infants be fed the BCG, and it was so administered in 1921 at the Maternity Hospital in Paris. Since that time nearly 100,000 infants have been given this prophylactic vaccination, but only a relatively small number of these have been recorded in statistical studies, and the reports of Calmette have been attacked as being statistically incorrect. Calmette is convinced of the innocuousness of the vaccine and of its ability to immunize against tuberculosis, and many workers have found the bacillus to be non-virulent for small laboratory animals. Others have been able to

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produce progressive disease, and Nobel[1] and Gerlach[2] were able to carry the lesion successively from guinea pig to guinea pig. Petroff and Branch[3] have produced progressive tuberculosis and death in guinea pigs and have dissociated the original Calmette culture into two strains—the "R" type which always produces some tubercles which in time heal, and the "S" type which invariably produces progressive disease terminating in death, in the guinea pig.

The BCG culture used in these studies was obtained directly from Dr. Calmette. The organism has been continuously cultivated on ox-bile glycerinated potato medium and we have endeavored to follow Calmette's instructions implicitly in this regard. We have found no difficulty in getting profuse growths. The colonies, which usually appear in about two weeks, are clear-cut and moist, but they soon dry and pile up rapidly and culturally resemble Petroff's "R" type, and in being difficult to emulsify have further agreed with his description. All animals which have died or been killed have had postmortem examinations and, in the majority of cases, reinoculations have been made. We have deliberately kept the groups of vaccinated animals small in order that we might test as many different transplants of the culture as possible. In these preliminary experiments the primary interest was in assuring ourselves of the innocuousness of the BCG for guinea pigs, monkeys and calves. The experiments are being continued and will be reported in more detail at a later time.

The experiments have been arranged in three main groups, according to the method of administration of the BCG: (1) oral, (2) subcutaneous and (3) intraperitoneal.

VACCINATION BY MOUTH

Guinea Pigs—Three groups of week-old guinea pigs were fed the vaccine as follows:

Guinea Pigs	50 mg. each		
6	3 feedings	Killed 25 weeks	Negative
6	3 feedings	Killed 21 weeks	Negative
12	7 feedings	Killed 27 weeks	Negative

Calves—Seven new-born calves were fed with the following results:

Calves	50 mg. each		
5	5 feedings	Killed 51 weeks	Negative
1	5 feedings	Killed 5 weeks	Negative
1	5 feedings	Living 2½ years	Negative tuberculin

Monkeys—Ten monkeys receiving from 3 to 12 feedings each, gave more interesting results (see top of next page).

The 4 monkeys which had tuberculous lesions had only small, discrete non-caseous tubercles of the lymph nodes. Two monkeys also had similar lesions in the spleen. Although infrequent acid-fast rods were present in the tubercles of 3 of

Monkeys	50 mg. each			
2	3 feedings	Killed	8 weeks	Negative
1	6 feedings	Died	8 weeks	Negative
1	9 feedings	Died	8 weeks	Negative
1	11 feedings	Killed	8 weeks	Negative
1	6 feedings	Died	13 months	Tubercles spleen, mesenteric nodes
1	11 feedings	Killed	8 weeks	Tubercles of mesenteric nodes, spleen
1	12 feedings	Killed	13 months	Tubercles of mesenteric nodes
1	12 feedings	Killed	23 months	Tubercles of mesenteric nodes
1	6 feedings	Living	$2\frac{1}{2}$ years	

these, triturates of the viscera and nodes failed to produce lesions when injected into normal guinea pigs.

The results of the feeding experiments show that we were unable to find evidence of the absorption of the BCG in 24 guinea pigs and 7 calves, whereas 4 of the 9 monkeys had small discrete tubercles in their mesenteric nodes.

ORAL VACCINATION FOLLOWED BY INFECTION WITH VIRULENT BACILLI

Guinea Pigs—Three groups of week-old guinea pigs are listed below. These animals were given 3 to 7 feedings of 50 mg. each.

Guinea Pigs	Interval	Infecting Dose	Method			Result
3	9 weeks	0.02 mg. bovine	Subcut.	Killed	21 weeks	Generalized tuberculosis
4	13 weeks	0.10 mg. bovine	Subcut.	Killed	13 weeks	Generalized tuberculosis
12	13 weeks	0.10 mg. human	Subcut.	Killed	8 weeks	Generalized tuberculosis

Eleven non-vaccinated controls gave the same tuberculous picture as the vaccinated animals.

Calves—Eight new-born calves, each receiving 5 feedings of 50 mg. each, and 7 non-vaccinated controls were included in this series.

Calves	Interval	Infecting Dose	Method			Result
2	30 weeks	10.0 mg. bovine	Subcut.	Killed	10 weeks	Localized cold abscess
				Control	10 weeks	Localized cold abscess
1	16 weeks	5.0 mg. bovine	Subcut.	Killed	36 weeks	Negative
				Control	10 weeks	Localized cold abscess
1	16 weeks	5.0 mg. bovine	Subcut.	Killed	36 weeks	Tuberculous node
				Control	10 weeks	Localized cold abscess
1	16 weeks	5.0 mg. bovine	Subcut.	Killed	10 weeks	Localized cold abscess
				Control	10 weeks	Localized cold abscess
1	30 weeks	1.0 mg. bovine	Vein	Killed	10 weeks	Bronchial, mediastinal nodes
				Control	10 weeks	Bronchial, mediastinal nodes
1	30 weeks	0.1 mg. bovine	Vein	Killed	10 weeks	Negative
				Control	10 weeks	Bronchial, mediastinal nodes
1	22 weeks	20.0 mg. bovine	Fed 2X	Killed	20 weeks	Negative
				Control	21 weeks	Negative

Two animals in this series failed to develop tuberculous lesions while their corresponding controls became infected. The attempt to infect by feeding was unsuccessful, neither control nor vaccinated calf reacting after two doses of 10 mg. each of bovine bacilli.

Monkey—One monkey was given 4 feedings of 50 mg. each, and 16 weeks after the last feeding it was injected subcutaneously with 0.3 c.c. of a very dilute suspension of human tubercle bacilli, and when killed 56 days later because of an open sinus at the site of inoculation it had, in addition to the local abscess, about

a dozen pea-sized caseous tubercles in the liver and spleen. Two control monkeys receiving the same dose of virulent organisms died on the 57th and 62d days respectively with massive tuberculosis of the viscera.

SUBCUTANEOUS VACCINATION

Guinea Pigs—Four groups totalling 22 guinea pigs were inoculated subcutaneously as follows:

Guinea Pigs			Result
1	3 mg.	Killed 13 months	Negative
1	3 mg.	Killed 18 months	Histological tubercles in lymph nodes, infrequent acid-fast rods
1	5 mg.	Killed 3 months	Histological tubercles in lymph nodes, infrequent acid-fast rods
1	5 mg.	Killed 3 months	Histological tubercles in lymph nodes, infrequent acid-fast rods
1	25 mg.	Killed 10 months	Negative
1	50 mg.	Killed 14 months	Negative
1	50 mg.	Living 14 months	
2	25 mg.	Living 14 months	
1	25 mg.	Killed 1 month	Histological tubercles in lymph nodes, acid-fast rods
1	25 mg.	Died 9 months	Secondary infection; histological tubercles, acid-fast rods
1	25 mg.	Died 9 months	Secondary infection; histological tubercles spleen
9	25 mg.	Living 15 weeks	
1	25 mg.	Died 10 weeks	Secondary infection; tubercles nodes, spleen, liver

The guinea pig in the 4th group which died of secondary infection showed an extensive tuberculosis of the mesenteric nodes, spleen and liver. The inguinal node at the site of inoculation was caseous. Acid-fast bacilli were present in the pus and in the tubercles of the mesenteric nodes and liver. This guinea pig is the only animal in our experience which has developed an extensive progressive tuberculosis after vaccination alone. The other animals in the group seem normal. One may consider that the single guinea pig which developed progressive tuberculosis is an instance of individual susceptibility. It does not seem likely that there were sufficient "S" type colonies in the small portion of vaccine inoculated to cause progressive tuberculosis in one guinea pig while the other guinea pigs in the same group have shown no evidence of progressive tuberculosis.

Two guinea pigs injected with the material from the caseous node and spleen of the tuberculous animal described above were negative to tuberculin 30 days later. One of these, killed at 32 days, showed no evidence of tuberculosis. The other is apparently normal, has gained in weight, and gives a negative tuberculin 90 days after the inoculation.

Monkeys—Eight monkeys were injected with 50 mg. each of vaccine:

Monkeys			Result
1	50 mg.	Died 37 weeks	Several pinpoint tubercles in spleen; acid-fast rods
1	50 mg.	Died 35 weeks	One macroscopic and several histological tubercles in lung and spleen; acid-fast rods
1	50 mg.	Killed 93 weeks	Negative
1	50 mg.	Killed 58 weeks	Histological tubercle in lung; acid-fast rods
4	50 mg.	Living 60 weeks	

Here again guinea pigs were injected with triturates of the nodes and spleens of the autopsied monkeys and failed to become infected.

Calves—Four groups, making a total of 46 calves, were injected, 50 mg. in each animal. Twenty-nine of these are living 9 months; 11, 5 months; and 5, 3 months after vaccinations. The 46th animal, a bull calf, gave a positive tuberculin 10 weeks after injection of the BCG, but the reaction became doubtful in the 42d week and was negative at 72 and again at 90 weeks. After the second negative tuberculin, the bull was placed on a farm to be used for breeding. The tuberculin test was repeated on the 120th week and it was found that the bull and several cows in the herd had developed positive tuberculins. The bull was slaughtered in the 124th week and was found to have tubercles in the bronchial and mediastinal nodes and in the lungs. It seems probable that this is a case of re-infection rather than evidence of the acquisition of virulence by the BCG on long residence in the animal. Calmette advises annual re-vaccination, which was not done in the case of this bull. Unfortunately it was impossible for us to be present at the autopsy; nor could we obtain the viscera in order that we might culture the bacilli in the lesions and ascertain if they were virulent.

In summarizing the subcutaneous series it should be pointed out that we were able to produce tubercles at the site of injection of the BCG in many of our animals. These lesions caseated in several instances. The production of minute tubercles in the adjacent lymph nodes occurred in the majority of the animals inoculated. Spleen involvement occurred in 4 animals with a further extension to the liver in one of these. In another animal, small tubercles were produced in the lung. One guinea pig which died 10 weeks after injection had extensive progressive tuberculosis apparently due to the BCG. Saline emulsions of the caseous material and tubercles of this guinea pig contained many acid-fast rods but failed to infect two normal guinea pigs on subinoculation. In fact, in no instance did saline emulsions and triturates of the BCG lesions of vaccinated animals produce tubercles when subinoculated into normal animals, although all of the material so inoculated contained acid-fast rods. Forty-five of the 46 calves are still living. We believe that at least 34 of these developed tubercles, since they became allergic within 12 weeks after vaccination, and 27 of 29 had lost this skin-hypersensitiveness by the 32d week.

SUBCUTANEOUS VACCINATION FOLLOWED BY INFECTION WITH VIRULENT BACILLI

Guinea Pigs—Three groups of vaccinated guinea pigs were subsequently infected by the subcutaneous method with the following results:

Guinea Pigs	BCG	Interval	Infecting Dose			Result
1	6 mg.	20 weeks	0.02 mg. bovine	Killed	2¼ years	Negative
1	6 mg.	20 weeks	0.10 mg. bovine	Killed	39 weeks	Negative
3	Controls		0.02 mg. bovine	Killed	21 weeks	Generalized tuberculosis
3	Controls		0.10 mg. bovine	Killed	52 weeks	Generalized tuberculosis
1	Control		0.10 mg. bovine	Died	52 weeks	Generalized tuberculosis

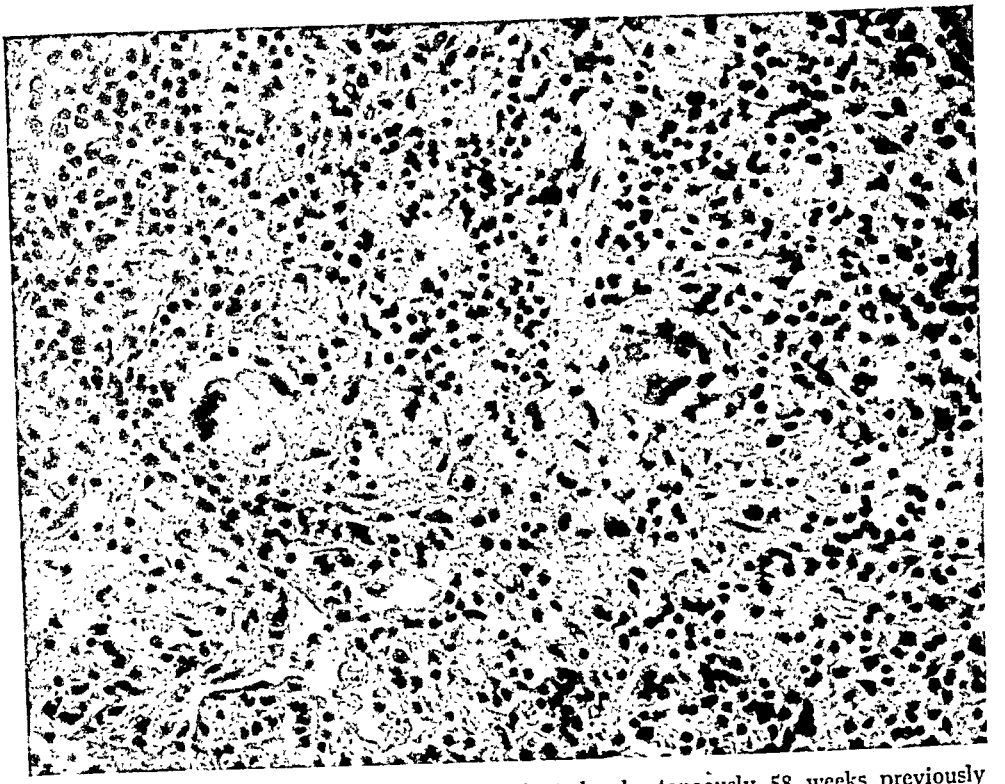


FIGURE I—Tubercle in lung of monkey vaccinated subcutaneously 58 weeks previously with 50 mg. of BCG. × 410.

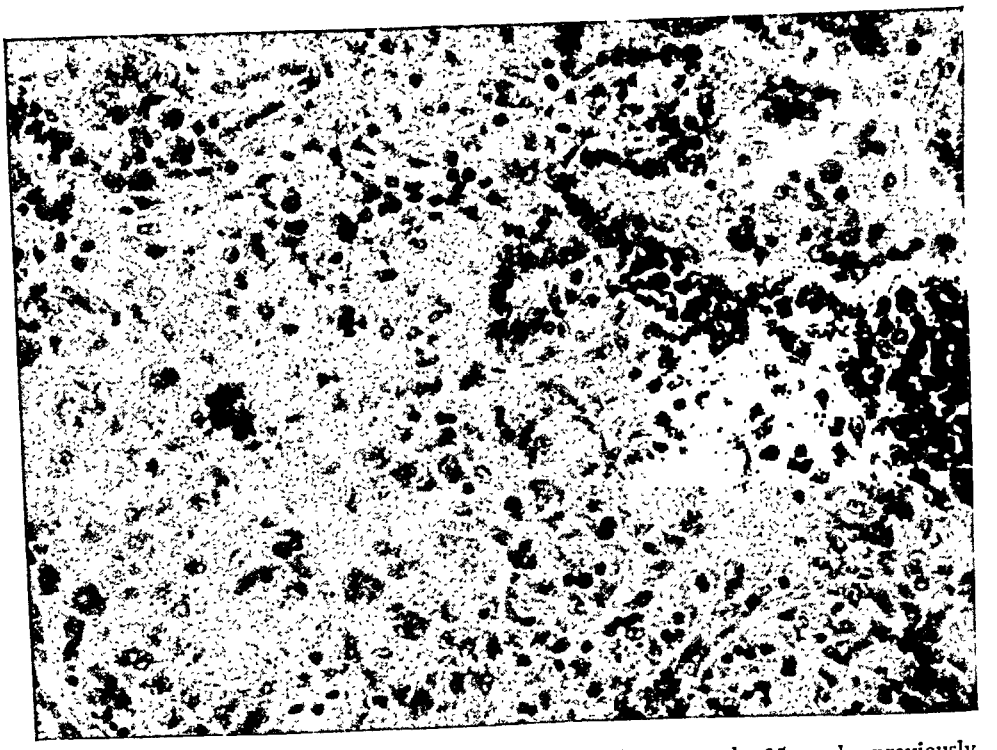


FIGURE II—Tubercle in lung of monkey vaccinated subcutaneously 35 weeks previously with 50 mg. of BCG. × 410.



FIGURE III—Caseous material from inguinal lymph node of guinea pig injected 10 weeks previously with 25 mg. of BCG into the groin. On subinoculation this material failed to infect normal guinea pigs. Ziehl-Neelson stain. × 1,810.

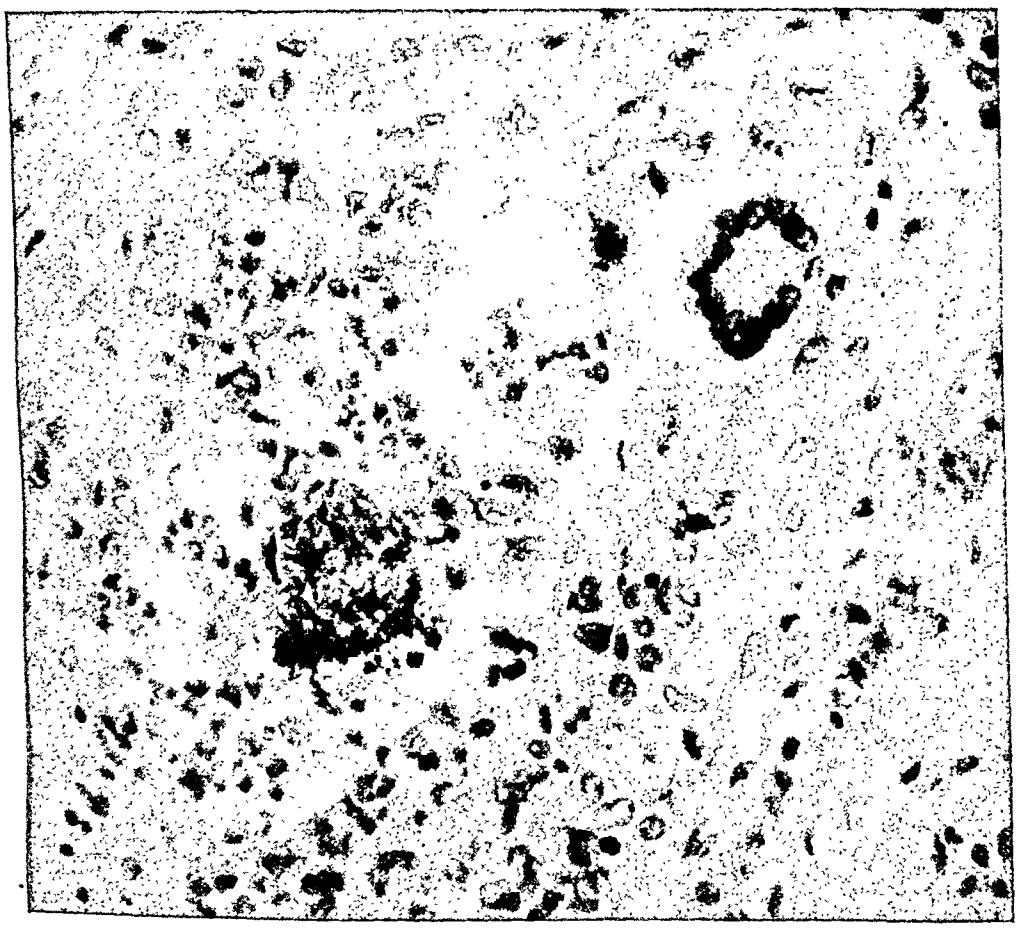


FIGURE IV—Lymph node of guinea pig vaccinated subcutaneously 10 weeks previously with 25 mg. of BCG. Ziehl-Neelson stain. × 640. Acid-fast rods were demonstrated in all lesions illustrated.

Guinea Pigs	BCG	Interval	Infecting Dose			Result
1	25 mg.	43 weeks	0.02 mg. bovine	Killed	8 months	Few discrete tubercles spleen, liver, lungs
1	25 mg.	43 weeks	0.02 mg. bovine	Killed	8 months	Few discrete tubercles spleen, liver, lungs
1	Control		0.02 mg. bovine	Died	7 months	Massive tuberculosis
2	Controls		0.02 mg. bovine	Killed	8 months	Massive tuberculosis
1	Control		0.02 mg. bovine	Died	9 months	Massive tuberculosis
1	50 mg.	4 months	0.3 c.c. human	Killed	33 weeks	Tubercles nodes, spleen
1	50 mg.	4 months	0.3 c.c. human	Died	45 weeks	Tubercles nodes, spleen
1	50 mg.	4 months	0.4 c.c. human	Killed	8 weeks	Tubercles nodes, spleen
1	25 mg.	4 months	0.5 c.c. human	Killed	23 weeks	Tubercles nodes, spleen, liver, lung
3	Controls		0.3 c.c. human	Died Av.	18 weeks	Generalized tuberculosis

There seems to be some evidence of protection in the vaccinated guinea pigs, for 2 failed to develop tuberculosis, while their controls developed extensive generalized tuberculosis. The remaining 6 guinea pigs developed tuberculosis, but much less extensively than their non-vaccinated controls.

Monkeys—Only 2 monkeys and 2 controls infected by the subcutaneous method are included in this series:

Monkeys	BCG	Interval	Infecting Dose			Result
1	50 mg.	16 weeks	0.3 c.c. human	Killed	57 days	Caseous nodes, tubercles in viscera
1	50 mg.	16 weeks	0.5 c.c. human	Killed	117 days	Caseous nodes, tubercles in viscera
1	Control		0.3 c.c. human	Died	57 days	Generalized tuberculosis
1	Control		0.5 c.c. human	Died	62 days	Generalized tuberculosis

The 2 vaccinated monkeys likewise developed more localized infection than their controls, which died in a shorter time.

Calves—The immunity experiments in calves are composed of 16 animals which are subdivided into 5 groups.

Calves	BCG	Interval in Weeks	Dose Bovine	Method	Killed in Weeks	Result
1	50 mg.	16	5.0 mg.	Subcut.	11	Cold abscess
1	50 mg.	16	5.0 mg.	Subcut.	40	Negative
1	50 mg.	16	5.0 mg.	Subcut.	40	Few tubercles adjacent lymph node
1	Control		5.0 mg.	Subcut.	11	Cold abscess
1	Control		5.0 mg.	Subcut.	13	Tubercles adjacent node
1	Control		2.0 mg.	Subcut.	13	Tubercles adjacent node
1	50 mg.	31	10.0 mg.	Subcut.	11	Cold abscess
1	50 mg.	31	10.0 mg.	Subcut.	11	Cold abscess
1	Control		10.0 mg.	Subcut.	11	Extensive tuberculous nodes
1	50 mg.	31	1.0 mg.	Vein	11	Tubercles bronchial, mediastinal nodes
1	50 mg.	31	0.1 mg.	Vein	11	Negative
1	75 mg.	8	1.0 mg.	Vein	21	Tubercles bronchial, mediastinal nodes
1	75 mg.	8	0.1 mg.	Vein	21	Negative
1	Control		0.01 mg.	Vein	12	Tubercles broncho-mediastinal, mesenteric nodes
2	Controls		0.1 mg.	Vein	12	Tubercles broncho-mediastinal, mesenteric nodes
2	Controls		1.0 mg.	Vein	12	Tubercles broncho-mediastinal, mesenteric nodes

Calves	BCG	Interval in Weeks	Dose Bovine	Method	Killed in Weeks	Result
1	50 mg.	22	0.01 mg.	Subcut.	44	Negative
1	50 mg.	22	0.01 mg.	Subcut.	44	Negative
1	50 mg.	66	0.01 mg.	Subcut.	22	Negative
1	50 mg.	66	0.10 mg.	Subcut.	22	Negative
1	Control		0.05 mg.	Subcut.	12	Negative
1	Control		0.02 mg.	Subcut.	25	Negative
1	Control		0.01 mg.	Subcut.	34	Negative
1	Control		0.10 mg.	Subcut.	34	Negative
1	50 mg.	21	100 mg.	Fed 2X	20	Negative
1	50 mg.	21	250 mg.	Fed 5X	20	Negative
1	50 mg.	21	500 mg.	Fed 5X	20	Negative
2	Controls		300 mg.	Fed 3X	20	Negative
2	Controls		20 mg.	Fed 2X	20	Negative

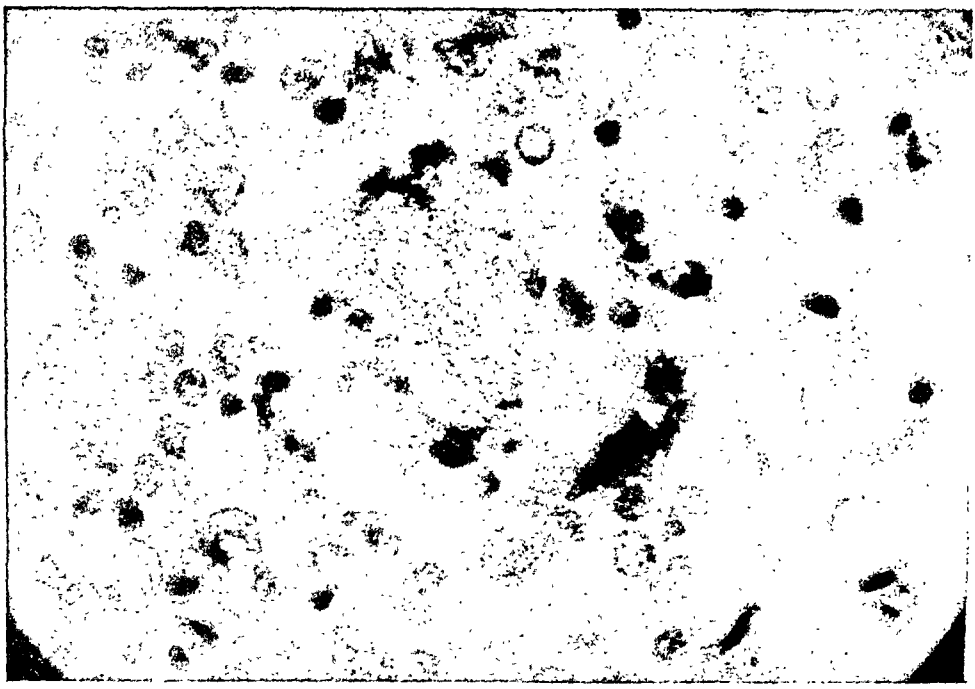
In the first 2 groups we again found some evidence of immunity in the vaccinated calves. In 3 instances the lesion was limited to cold abscess formation, with no lesion in 1 calf and lesions in the regional lymph node in but 1 calf, whereas in the controls lesions were found in the adjacent nodes in every case except 1, where a cold abscess was present. In the 3d group 0.1 mg. intravenously did not produce lesions, while this dose, as well as 0.01 mg., produced lymph node lesions in the control calves. In both instances 1.0 mg. intravenously in control calves produced lesions in the mesenteric nodes as well as in the broncho-mediastinal nodes, whereas in the vaccinated calves 1.0 mg. produced lesions in only the broncho-mediastinal groups. Complete immunity was apparently produced in the feeding series and in the series where doses of 0.1 mg. and 0.01 mg. were injected subcutaneously, but unfortunately tuberculosis was not produced in the control calves in either of these series.

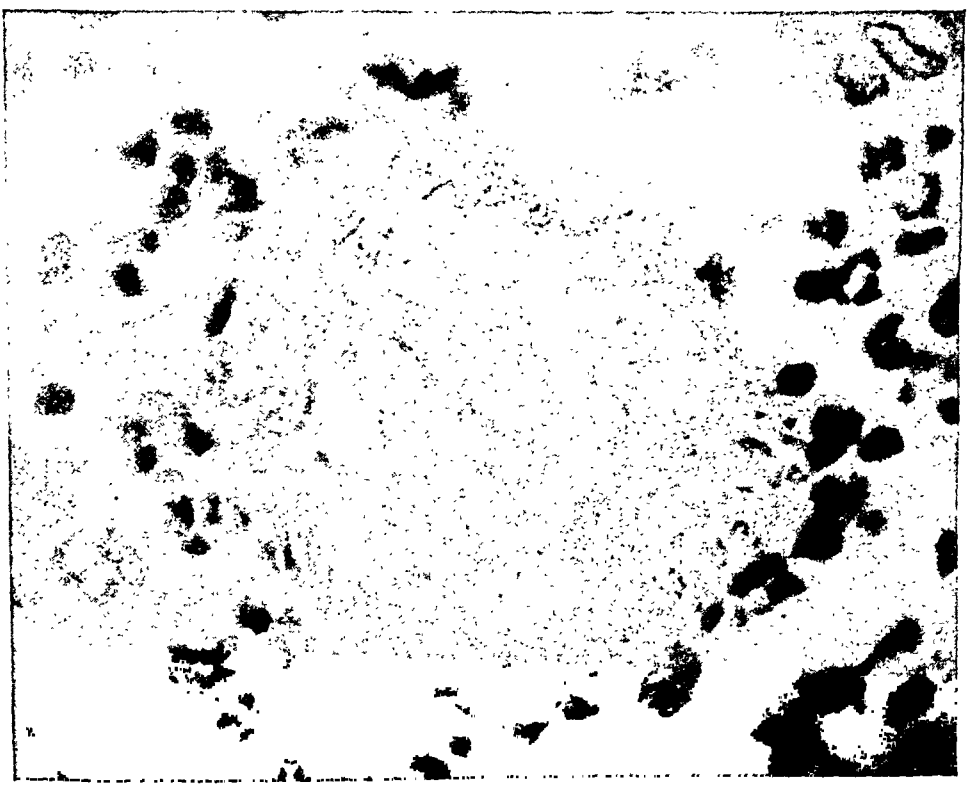
INTRAPERITONEAL VACCINATION

Guinea Pigs—The series consists of 2 groups of 6 animals each:

Guinea Pigs			
3	25 mg.		Living 30 weeks
1	25 mg.		Killed 29 weeks; tubercle spleen
1	25 mg.		Killed 29 weeks; caseous node, small tubercle spleen, liver
1	50 mg.		Living 30 weeks
		Re-vaccination	
1	25 mg.	8 weeks 25 mg. subcut.	Living 20 weeks
1	25 mg.	8 weeks 25 mg. subcut.	Died 13 weeks; secondary infection; tubercles mesenteric nodes
1	25 mg.	8 weeks 25 mg. subcut.	Killed 19 weeks; tubercles omentum
1	25 mg.	8 weeks 50 mg. subcut.	Living 20 weeks
1	25 mg.	8 weeks 50 mg. subcut.	Died 16 weeks; secondary infection
1	25 mg.	8 weeks 50 mg. subcut.	Living 20 weeks

In this series 2 guinea pigs died at 13 and 16 weeks after a second vaccination, the vaccinations being only 8 weeks apart. In the first of these guinea pigs there were histological tubercles in the mesenteric nodes containing infrequent acid-fast rods. In both animals there were extensive peritoneal adhesions with foci of acute abscessation in the nodes, spleen, liver and omentum, but normal guinea pigs injected with triturates of the viscera and nodes of each failed to develop tubercu-





FIGURES V and VI—Tubercles of abdominal lymph nodes of guinea pigs vaccinated subcutaneously 10 weeks previously with 25 mg. of BCG. Ziehl-Neelson stain × 1,140.

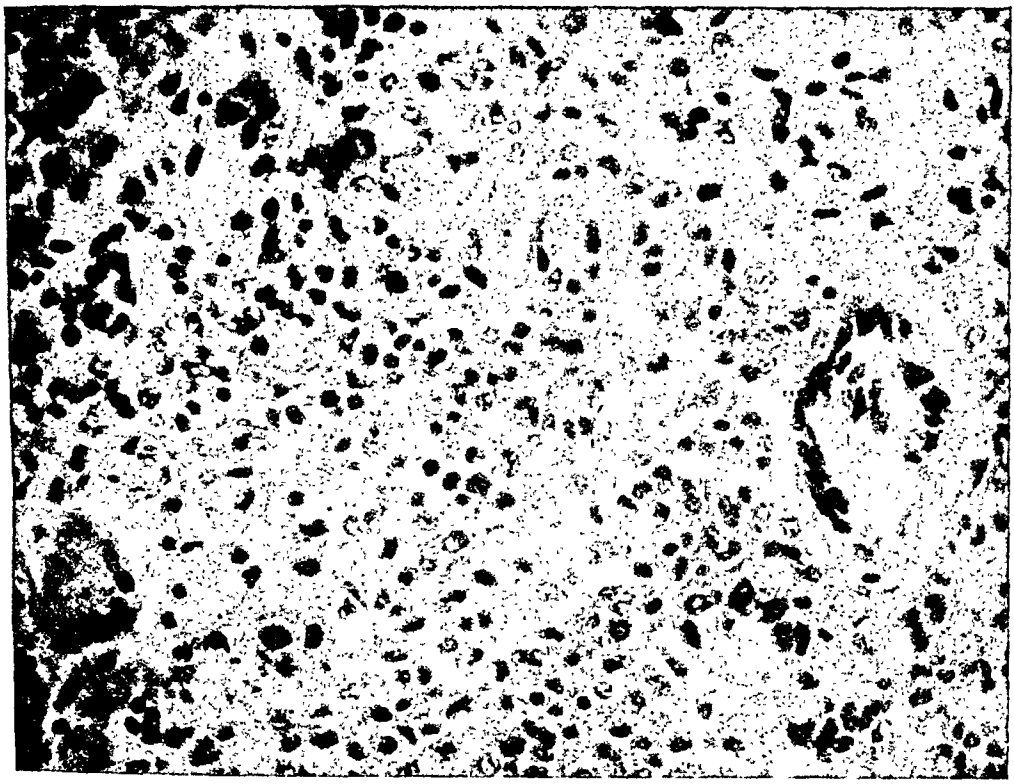


FIGURE VII—Tubercle in spleen of guinea pig vaccinated subcutaneously 10 weeks previously with 25 mg. of BCG. Ziehl-Neelson stain. × 510.

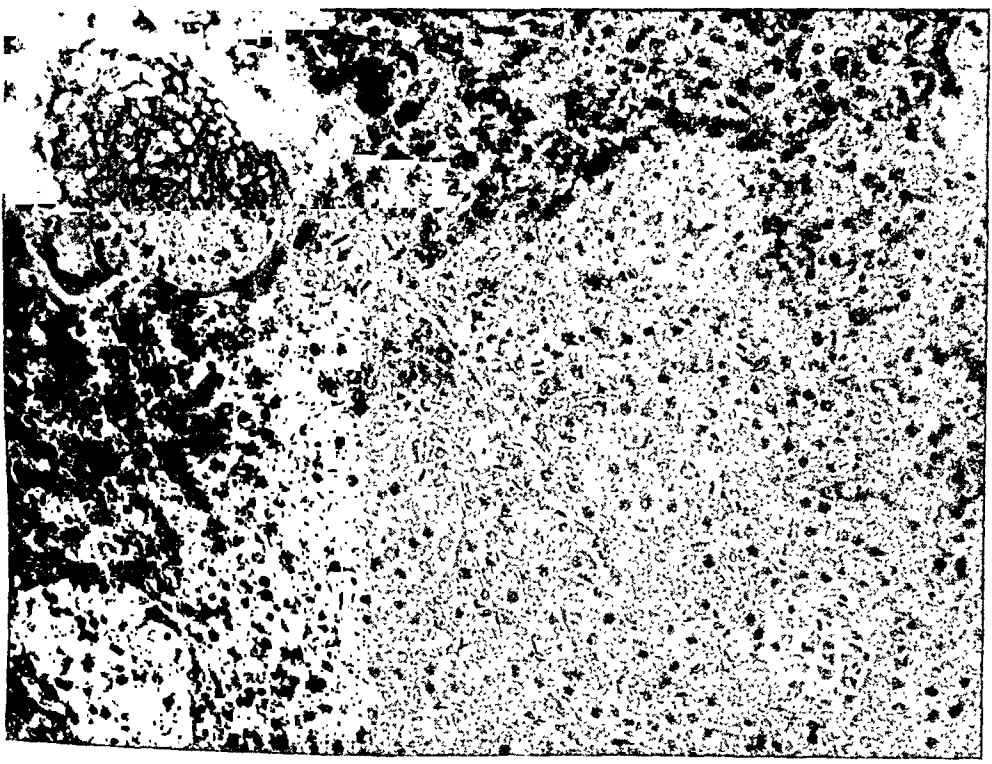


FIGURE VIII—Tubercles in liver of guinea pig vaccinated subcutaneously 10 weeks previously with 25 mg. of BCG. Ziehl-Neelson stain. × 275.

losis. It seems likely here that massive injections of the BCG so lowered the resistance that the guinea pigs developed secondary infections. Two of the 3 which were killed had only small discrete tubercles, while the 3d had also caseous omental and peritoneal nodes. Each of these guinea pigs had a few peritoneal adhesions.

INTRAPERITONEAL VACCINATION FOLLOWED BY INFECTION WITH VIRULENT BACILLI

Guinea Pigs—This series consists of 3 groups of guinea pigs which received subcutaneously 50 mg. each of the BCG vaccine, with the exception of the first guinea pig which received 25 mg.

Guinea Pigs	Interval	Infecting Dose		Result
1	10 months	0.3 c.c. human	Killed 33 weeks	Tuberculosis of viscera
1	3 months	0.2 c.c. human	Died 39 weeks	Tuberculosis of viscera
1	3 months	0.2 c.c. human	Killed 9 weeks	Tuberculosis of spleen
1	Control	0.2 c.c. human	Killed 16 weeks	Massive generalized tuberculosis
1	Control	0.2 c.c. human	Died 12 weeks	Massive generalized tuberculosis
1	Control	0.3 c.c. human	Died 10 weeks	Massive generalized tuberculosis
1	3 months	0.1 mg. bovine	Killed 33 weeks	Tubercles in nodes, spleen
1	3 months	0.01 mg. bovine	Killed 33 weeks	Tubercles in nodes, spleen
1	Control	0.1 mg. bovine	Killed 33 weeks	Massive generalized tuberculosis
1	Control	0.2 mg. bovine	Killed 33 weeks	Massive generalized tuberculosis
1	13 weeks	0.3 c.c. trit.	Died 20 weeks	Pneumonia; tuberculosis
1	13 weeks	0.3 c.c. trit.	Killed 34 weeks	Few discrete tubercles of spleen, liver and lung *
1	Control	0.3 c.c. trit.	Died 14 weeks	Generalized tuberculosis
1	Control	0.3 c.c. trit.	Died 22 weeks	Generalized tuberculosis

* Three guinea pigs were injected with triturates of spleen and nodes of this guinea pig. All were negative when killed after 20 weeks.

In summarizing this small series it is evident that in the first and last groups the vaccinated guinea pigs developed less extensive tuberculosis and in general outlived the controls. The last group is interesting in that the virulent human bacilli used for inoculation were obtained from the triturate of a vaccinated guinea pig killed 10 months after infection. Therefore, the human bacilli used for inoculation in the last animal in the 3d series had had a total residence of 74 weeks in vaccinated guinea pigs, and upon subinoculation they failed to infect 3 normal guinea pigs.

TUBERCULIN REACTION

We were unable to produce skin hypersensitiveness in 54 new-born guinea pigs and calves which were fed the vaccine. This is not in accord with the findings of Calmette.

Thirty-five of a series of 46 subcutaneously vaccinated calves had positive tuberculin reactions from 8 to 12 weeks later, but by the 32d week 27 of a group of 29 of these had lost their hypersensitiveness.

Sixteen of 23 guinea pigs and 9 of 10 monkeys were hypersensitive at 8 weeks after subcutaneous vaccination, and 16 of 19 guinea pigs were allergic 19 weeks after intraperitoneal vaccination.

In brief, 75 of 97 subcutaneously or intraperitoneally vaccinated guinea pigs, calves and monkeys developed positive tuberculin reactions, whereas 39 new-born guinea pigs and 15 new-born calves did not become allergic after being fed the vaccine.

SUMMARY

We were able to produce small discrete non-progressive tubercles in guinea pigs and monkeys which were vaccinated subcutaneously and intraperitoneally. In no instance were these lesions reproduced upon guinea pig subinoculation. After subcutaneous injection of the vaccine we were able to demonstrate progressive tuberculosis in 1 guinea pig. We are unable to account for this occurrence but suggest that it depended upon some individual susceptibility of the animal.

In 3 instances death from secondary infections has occurred in subcutaneously vaccinated guinea pigs, and in these animals we were able to find more than the usual discrete tubercle formation which has been the characteristic lesion produced by the BCG. The lesions here were modified by the secondary inflammatory changes, and triturates of these tissues when injected into normal guinea pigs failed in every instance to produce tubercles. These guinea pigs were injected with large doses of the vaccine and it seems likely that there is a danger of lowering the general resistance of the animal by massive injections of the BCG.

The results in the attempt to vaccinate animals subcutaneously were suggestive. While vaccinated animals which were later infected with virulent organisms as a rule developed more or less progressive tuberculosis, they generally developed the disease to a lesser extent than non-vaccinated controls which received the same injections of virulent organisms.

So far as the feeding results go in new-born guinea pigs and calves, no evidence has been shown of infection with the vaccine nor of protection by it in the guinea pigs. Two of 8 calves in this group did, however, show evidence of protection. In fairly young but not new-born monkeys, on the other hand, there was evidence of slight absorption; 4 monkeys out of 9 which were fed the vaccine were found at autopsy to have localized tubercles, usually in the mesenteric nodes. These findings indicate that the bacilli in the vaccine may pass the mucous membrane of the intestinal tract of monkeys. The fact that inoculation of these tubercles into normal guinea pigs failed in every

case to infect indicates the successful attenuation of our BCG cultures when grown continuously on the bile medium of Calmette. However, we do not feel justified in drawing conclusions as to the absolute safety of the BCG vaccine until further experimentation has been done covering a period of years on vaccinated animals. We cannot emphasize too strongly the importance of continuous cultivation of the BCG on the bile medium.

The impossibility of infecting normal calves with feeding of what we considered infective doses of virulent cultures shows the absolute necessity of sufficient controls; without these we would have believed that the lack of infection in the vaccinated animals indicated immunization, when it simply showed the difficulty of infecting them through the intestinal tract.

It is interesting to note that none of the guinea pigs and calves fed the vaccine developed hypersensitiveness to tuberculin, while a large majority of those receiving the BCG subcutaneously and intraperitoneally became allergic. The hypersensitiveness usually appeared by the 8th week and seemed to last on an average from 6 to 10 months. In monkeys, in contrast to guinea pigs and calves, the bacilli in the vaccine passed the intestinal mucosa, and produced hypersensitiveness and localized tubercles in the mesenteric nodes. We feel certain that the positive findings in the orally vaccinated monkeys arose from the BCG, since 24 normal control monkeys failed to react to tuberculin and were negative at autopsy.

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Photomicrographs by Arthur R. Riddle of the Hegeman Memorial Research Laboratory.

Ultra-Violet Ray Therapy and Public Health Clinics*

HENRY J. GERSTENBERGER, M. D., FELLOW A. P. H. A.

Director of Pediatrics, Babies and Children's Hospital, Cleveland, O.

ULTRA-VIOLET ray therapy as it is generally used today consists in exposing for varying periods of time a greater or lesser area of uncovered skin to artificially produced radiant energy, containing in addition to other rays those having wave-lengths measuring from 2,900 to 3,100 Angstrom's units (A. U.), and being of an intensity sufficient to produce an erythema.

The two practical artificial sources of these rays in general use at the present time are the quartz enclosed mercury vapor arc lamp and the unenclosed carbon arc lamp. In the form in which industry has made them available for use in home and office practice the quartz mercury vapor arc is the more bountiful source of these special rays. However, by replacing the core of the carbon sticks with minerals such as iron, aluminum and nickel and by using a greater amperage it is possible to obtain from such carbon arcs a quantity of the 2,900 to 3,100 Angstrom's wave-length rays equal to that produced by the quartz mercury vapor arc lamps.

The carbon arc, in addition to these rays, produces in much greater quantities luminous and infra-red rays, the former and some of the latter of which are considered by Sonne and others to be responsible for some of the beneficial results generally credited entirely to the ultra-violet rays.

A priori, one would imagine that a source of radiant energy giving off a light whose spectrum corresponds closely with that of summer sunlight would have therapeutic advantages over any other kind of artificial light. This idea would seem to be substantiated by the opinion rather generally held by men who are treating tuberculous patients; namely, that sunlight as a therapeutic agent is decidedly superior to any artificial source of radiant energy. It should be kept in mind, however, that when an individual is exposed out-of-doors to the rays of the sun he is at the same time being subjected to a variety of

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

additional climatic factors which in themselves may be of great influence in improving the condition and resistance of his body. Consequently, it is possible that, after all, the beneficial therapeutic effect derived from sunlight is principally or even solely due to the action of the narrow band of ultra-violet rays above referred to. This conclusion, however, apparently has been proved to be applicable to but one disease, rickets. A. F. Hess and others having found by the use of filters that rays of wave-lengths of 3,200 Angstrom's units and above have no antirachitic value, while those of 3,100 to 2,890 Angstrom's units have. For tuberculosis and other diseases, such as anemia, respiratory tract infections, chorea, pertussis, etc., such a specific finding has not been satisfactorily made.

Webster, Colebrook, Eidinow and Hill, however, have shown that doses of ultra-violet rays which produced erythema increase the non-specific bactericidal power of the blood for a period varying from 1 to 4 hours. They obtained some evidence of a preliminary stage of depression of the hemo-bactericidal power ½ hour after exposure. They state that absorption into the blood of the products of tissue damage or the enhanced absorption of normal tissue products produced by such damage with the consequent erythema and edema appears to be a natural excitant of immunizing mechanisms, whether the damaging agent be ultra-violet rays, visible rays, dark heat or blistering agents. In some cases they found, when large areas and intense dosage were utilized, a decided fall in the bactericidal power. They conclude that the intensity of the erythema produced and the surface area of skin irradiated per kilogram body weight control the bactericidal response of the blood to irradiation of the skin.

Whether the improvement which, according to most observers, follows ultra-violet therapy in peritoneal and glandular tuberculosis and in scrofula is due to products of tissue damage, or whether it is produced by the absorption of some photosynthesized product other than irradiated ergosterol, or whether both or still other factors are responsible, is impossible to state. Our own experience with the use of ultra-violet rays in the treatment of pulmonary tuberculosis, especially of the types characterized by lobar exudates, even when they proceed to cavity formation, has been surprisingly good, and much better than reported in the literature. However, a speedy cure following exposure to ultra-violet rays such as is regularly witnessed in rickets is not seen in tuberculosis, except in the rarest instances.

Inasmuch as no specific ultra-violet ray deficiency disease except rickets has been established so far, it is necessary to assume that all beneficial effect of irradiation in other conditions or diseases is due to the development and action of one or more non-specific factors.

This fact limits scientifically preventive ultra-violet therapy to rickets. This disease, however, is quite as satisfactorily prevented and cured by the use of the more economic and old-fashioned cod liver oil or by the ingestion of small doses of the modern irradiated ergosterol. Consequently, there is no justification for establishing ultra-violet ray clinics for the prevention of this disease.

It should be stated at this point that it has been demonstrated that the antirachitic value of irradiated material can be reduced and completely destroyed by further and excessive exposure to the quartz mercury vapor arc, and also that animals can be killed by giving irradiated ergosterol in too liberal quantities. Both of these observations indicate that great caution must be exercised both in its preparation and in its use.

As ultra-violet therapy has not been proved to be a specific agent in the cure of tuberculosis, anemia, respiratory infections, etc., and as it is known that these diseases develop in individuals who have had the benefit of their use, and as the disease which is specifically cured by the ultra-violet rays, namely, rickets, has not been demonstrated to be present in those above the age of 3 years, it would seem unwise to advocate at this time the general establishment by public health departments of the rather expensive ultra-violet ray clinics for the prevention of disease. I come to this conclusion in the face of my own conviction, based upon clinical experience, that the exposure to ultra-violet rays, properly managed, is of value not only to infants but to children and adults during the winter months in those parts of the country where climatic conditions make impossible an adequate exposure of the individual's skin to ultra-violet rays.

I see no objection, however, to collecting observations on a big scale, over a period of 5 to 10 years, on the efficacy of ultra-violet ray exposures on the general health of school children. If half of the school children for 5 consecutive years can be exposed in a minimal fashion and under proper supervision to the ultra-violet rays, while the other half remains unirradiated, evidence may be obtained which will justify the expenditure of funds coincident with the establishment and operation of ultra-violet clinics.

Another reason for hesitating to advocate at this time the use of ultra-violet ray therapy by public health clinics in the prevention of disease is the fact that we probably know but little concerning the functions of the radiant energy produced by the lamps under discussion. In a statement prepared by the Council on Physical Therapy of the American Medical Association for the Scientific Exhibit at the Minneapolis meeting, it was emphasized that:

Before light can be used therapeutically with the best results, its relation between effect and wave-length must be well understood. Thus far, probably but one of the physiological effects of radiant energy has been studied with a desired thoroughness, namely the effects of visible light in arousing the sensation of vision. The efficiency of the human eye has been accurately determined by the different wave-lengths in the visible zone of the spectra, and a curve called the luminosity curve has been plotted showing the variation of efficiency with wave-length. Not only does this curve vary with different persons but it also shifts with a change in the intensity and the spectral energy distribution of the source of light.

In his address at the last meeting of the American Medical Association, Dr. William T. Bovie expressed the same view and emphasized that actino therapy today still is a complicated subject.

In conclusion, let me say that from the standpoint of the best and greatest development of preventive medicine it is my conviction that scientifically established facts, adequate clinical substantiation of their practical value and conservatism should be the guides of a health agency in determining its course of action in actively furthering the prevention of disease.

Swiss Law Requires Measures Against Tuberculosis

SWITZERLAND'S Federal Law of June 13, 1928, requiring measures for the prevention and cure of tuberculosis is soon to go into effect. Heretofore, certain cantons and municipalities have had regulations for this purpose, but this is the first time that comprehensive measures on a national scale have been prescribed.

The law requires that all cases of tuberculosis in a contagious stage be reported to the government by the attending physicians and that medical supervision be given children and teachers in all schools, asylums, and similar institutions. Any pupil or teacher with tuberculosis in a contagious stage is to be removed from the school or institution, and when necessary is to be given free treatment.

The cantons are required to take certain measures for the prevention and treatment of tuberculosis, such as establishment of health centers, vacation camps for children predisposed to tuberculosis, preventoriums, convalescent homes, and sanatoriums. The law also requires the cantons to see to it that employment agencies for tuberculous patients are established wherever necessary.

Detailed regulations are prescribed for housing and public hygiene and for education of the public in personal hygiene. The work of enforcement is to be carried out by the federal government, the cantons, and the municipalities, in coöperation with private agencies. The cost of the work is to be met by the federal government and by the cantons.—*Bull. des Eidgenossischen Gesundheitsamtes,* Bern, No. 31, 1928, supplement.

The Effect of Various Types of Shoes upon the Feet and Posture of High School Girls*

IZA WHITE MERCHANT AND KATHERINE CRANOR

Department of Home Economics, Iowa State College, Ames, Ia.

AN experiment to determine the effect of various types of shoes upon the feet and posture of high school girls was carried on by the authors in coöperation with the departments of physical education of the high schools of Ames, Ia. Three hundred and sixty-eight high school girls participated in the experiment.

Shoes were examined as to type, and measured; feet were measured and examined for defects; and footprints were taken.

To determine the relation of posture to shoes, schematograph pictures of back and side views were made of 167 senior girls.

X-ray pictures were made of normal and defective feet with and without shoes, and of feet when both low and high heels were worn. X-rays were also made to determine the effect of high heels upon the position of the bones of the pelvic region.

Posture defects noted among 42 girls wearing high heels:

36 neck bent forward
32 protruding abdomen
42 narrow curve between shoulder and hip

X-ray pictures indicate a tilt of 40° in pelvis when extremely high heels were worn, muscles in upper leg not exercised, muscles in lower leg over-exercised, shape of leg spoiled by the muscles being pushed to back of calf.

Posture in every instance was better in bare feet than with high heels. Eighty-nine per cent of the girls having good feet had good posture.

In every instance, where a girl had one high hip and one high shoulder, she was found to have an overdeveloped foot on the opposite side.

COMPARISON OF RESULTS

	1927 Per cent	1928 Per cent
Girls wearing oxfords	60	80
Shoes short and narrow	77	20
Poor longitudinal arches	72	60
Poor transverse arches	90	80
Flat feet	40	10
Rotating heels	62	55
Corns or callous	54	78
Normal feet	1	3

Improvement noted in the choice of shoes over those of 1927 was 37 per cent. Of last year's girls there were 14 per cent who had improved the condition of their feet. The girls whose feet were outstandingly good or bad last year are the same ones this year.

* This is an abstract of a monograph published by the authors. It also gives additional material which was discovered in the continuation of the study begun in 1927.

EDITORIAL SECTION

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WORLD HEALTH CONDITIONS

THE annual report which the Surgeon General of the U. S. Public Health Service has just submitted to Congress is interesting on account of the summary of world conditions which it gives, and also as it demonstrates once again the high degree of protection given to the people of this country by that service. Not only does the service gather knowledge daily as to the prevalence of communicable diseases in every part of the world, but there is also medical examination of immigrants about to sail for this country and inspection of the vessels and seamen, in addition to which a second medical examination must be undergone at the port of arrival. During the year no case of any quarantinable disease was brought into our country.

In general the past year has been a favorable one in regard to health. There were no great epidemics, and the efficiency of modern health organization was demonstrated by the fact that in no country in which such organization has been established has there been an outbreak of any of the diseases which in the past we have had so much cause to fear.

Bubonic plague still appears to be the disease which is our chief menace, India being the great potential focus of infection. However, cases were reported from French Indo-China, China, Algeria, Madagascar, Nigeria, Siam, Argentina, Ecuador, South Africa, Greece and Russia. Two cases, contracted from ground squirrels, occurred in California, the only ones reported on the North American continent.

Yellow fever, apparently of a peculiarly virulent type, occurred in a number of places in Africa, especially along the west coast. Of more direct interest was the fairly extensive epidemic in Rio de Janeiro, beginning in May, 1928. The case fatality rate was 55.5 per cent.

Smaller outbreaks occurred in some other South American ports and interior cities.

While typhus fever has not been unduly prevalent in Europe, recent studies show that it is endemic in the United States, especially along the Atlantic seaboard and in the lower Rio Grande Valley. Fortunately it is of a mild type.

Smallpox continues to be a blot upon our record. Approximately 34,000 cases occurred in the United States in 1927. With the exception of India, we lead the world in this respect. Certainly there is a call for especial activity on the part of health officers and health workers to combat the false ideas which are constantly being put forward in regard to vaccination, as well as the apathy of the public in regard to this simple, safe and efficient preventive.

Attention is called to the death rate from two diseases which are too generally considered insignificant, and necessary to childhood—measles and whooping cough. In the reporting states, some 4,000 deaths occurred from measles and 7,000 from whooping cough during the year 1927, figures which prove that these diseases call for care and are not to be regarded as trivial.

The work of the Service in keeping in touch with world conditions has been tremendously aided by the Health Committee of the League of Nations, and as far as the Eastern countries go, by the establishment of a reporting station at Singapore. This station collects information from India, China, Japan, the Malay states, the Philippines, Borneo, Australia and the east coast of Africa. It is cabled weekly to Geneva, where it is combined with similar reports from Europe and America, and the final results relayed to all parts of the world.

Those who keep in touch with the *Public Health Reports* are more or less familiar with many of the facts contained in the interesting report of the Surgeon General, which, however, summarizes the information from all parts of the world for the entire year.

METHODS OF SECURING THE 1930 CENSUS BY SANITARY AREAS FOR CITIES

AN increasing interest, on the part of health officers and executives of volunteer health agencies of cities, in the permanent area basis for enumeration of city populations has developed with the approach of the 1930 decennial census.

The procedure necessary to obtain this from the U. S. Bureau of the Census is simple and should be understood by those concerned with

the accurate analysis of such health and social problems of their communities as depend for their solution upon complete data regarding the population in small areas with permanently established boundaries.

New York, Cleveland and St. Louis are the only cities which have availed themselves of the willingness of the U. S. Bureau of the Census to assist communities in obtaining neighborhood facts.

Although New York (which furnished a map for the 1910 Census) was the only city that furnished the Bureau with permanent maps for the taking and tabulation of enumeration data, the Bureau, of its own motion, subdivided the political units used by itself for publication purposes into census tracts, in the case of all cities of 500,000 population and over, and the tabulated results were and are at the service of local committees who will undertake their transcription for publication. In 1920 this service was repeated.

New York's population of 1910 was tabulated and the data were published by the Cities Census Committee in terms of 707 neighborhood units. Its map of 1920, with an increase to 3,427 units resulting from the subdivision of all areas of over 80 acres, was the basis of 1,630 neighborhood tabulations by the Bureau and of their publication by the coöperating New York committee.

The map of 1920 is New York City's permanent map for neighborhood census enumeration and tabulation, and one of the functions of its local committee, essential to the system, is to keep the same up to date as to street nomenclature and layouts, and to furnish the Bureau, on the eve of every census, with accurate maps, in sufficient quantity, for actual enumeration.

Chicago, Cleveland, Detroit, St. Louis, Pittsburgh, Boston and any other city anticipating the benefits of a permanent area basis for its 1930 enumeration and tabulations, must furnish the Geographer's Division of the U. S. Bureau of the Census with a uniform area unit map which will register the community's own drafting of its neighborhood boundaries. While New York City's census tracts, or sanitary areas as they are commonly called, are of approximately 40 acres each, probably an area of 160 acres for each such unit would serve the purpose satisfactorily in other cities.

This primary procedure in order that any city may receive the benefit of a permanent area basis for its enumeration and tabulations is necessary because of the extensiveness and complexity of the tasks of the Geographer of the Census. He must assemble, or prepare, for every square foot of the continental area of the United States and of its outlying possessions the office and field maps which are indispensable requisites for the 1930 Census.

To have ready for the portfolio of each of the 100,000 or more enumerators likely to be engaged in the 1930 Census, a map of the territory to be covered by him, and to be sure when all the portfolios have been distributed that no area of human habitation has been omitted, is a Herculean task. If to this the cities of the nation, desiring tabulations of neighborhoods smaller than those essential to the Bureau's own publication plans, add the task of subdividing their areas into permanent units for supplying them with information more detailed than the resources of the U. S. Bureau of the Census allow it to print, they are asking the Geographer to imperil what is imperative in the discharge of his duties, and are, moreover, asking him to perform a task for which the necessary data are not available in the U. S. Bureau of the Census.

One of the publications of the Bureau (*Financial Statistics of Cities having Population of 30,000 or Over*, U. S. Dept. of Commerce, 1925) gives the total area of all cities of 30,000 or over in the United States; but there is no Census publication giving the area of wards or other political subdivisions of cities, and without an area measurement of the units used by the U. S. Bureau of the Census itself, these units cannot be subdivided intelligently for a permanent map.

Experience has shown that there are many cities in the United States in whose engineers' offices cannot be found acreage measurements of the units employed by the Bureau for tabulation and publication purposes, and any city that expects the Geographer of the Census to institute a permanent area basis when the data requisite therefor are not in existence, is expecting too much.

A worker in Washington, moreover, cannot be expected to be so minutely familiar with the topography of all American cities as to be able, even when ward or other acreages are known to him, to subdivide such acreage into units most usable for the local community. This is a job suitable for a local committee.

These considerations compel the preparation, by any city desiring a permanent area basis, of a neighborhood map in which the entire area of the city is divided by established street boundaries into 160-acre tracts or multiples of them, using the official map of the city as the basis therefor. This map must be registered before July 1, 1929, with, and be accepted by, the Geographer of the Census for the taking and tabulating of the Census of 1930.

Any city which does not take this step deliberately excludes itself from participation in any tabulation of its population other than that required for the U. S. Bureau of the Census for its own purposes.

This, however, is not the whole of the matter. In a recent com-

munication to the coöperating New York committee the Director of the Census says:

> I have given instructions that the tract system shall be abandoned unless the cities (i.e., through some organization of authority) give us a definite promise that the material will be utilized somewhat as you utilized it for New York. The tabulating of this great mass of detailed material by tracts and then laying it aside is, to my mind, a wasted effort.

A city, therefore, desiring the benefit of a permanent area basis for neighborhood tabulations of its population must not only equip itself with some kind of organization which will prepare for the Geographer's Division a map which will enable that division to take the enumeration in such wise that the tabulation can be produced, but must be able to assure the Bureau that the tabulation when produced will be transcribed for publication by a local committee in such wise as to meet the needs of neighborhood population survey and service in its local community.

The Cities Census Committee, Inc., 200 Fifth Avenue, New York, N. Y., which exists primarily to secure to New York City, and cities of 100,000 in its immediate neighborhood, the benefit of a permanent area basis for population enumeration and tabulation, and whose charter permits it to assist other cities of similar size in securing the same benefits, puts its experience at the disposal of all communities interested in this subject.

ASSOCIATION NEWS

A. P. H. A. ACKNOWLEDGES INTEREST OF STATE HEALTH PUBLICATIONS

The Association wishes to express its appreciation to the many state and local health departments who have aided in disseminating information of the activities of the Association, especially through the columns of their weekly and monthly health bulletins. The New York State Department *Health News* recently carried an article on "The Appraisal Form for City Health Work, 3d Edition, 1929," which brought this new volume to the attention of many health workers who might not otherwise have been reached. Likewise the Christmas issue of the West Virginia *News Letter,* published semimonthly, offered its coöperation by publishing the "Season Greeting" sent out by the Committee on Administrative Practice, A. P. H. A.

DR. DAVIS DIES OF HEART ATTACK

William H. Davis, M.D., chief statistician of the Bureau of the Census, Washington, D. C., died January 8 in Washington of a heart attack while ill with influenza. Burial was in Washington, January 11.

Dr. Davis was an untiring worker in the Association, having served as vice-president during 1923–24 and taken an active part in the program of the vital statistics section. At the time of his death he was chairman of the Committee on Forms and Methods of Statistical Practice.

MISS JEAN GOES TO THE ORIENT

Sally Lucas Jean, health education consultant and one of the organizers of the Child Health Organization and later director of the health education division of the American Child Health Association, sailed January 12 from Seattle for the Philippine Islands where she will develop a health education program in the schools at the request of Governor-General Henry L. Stimson. Miss Jean will inaugurate the program which will be carried out over a 2-year period by Miss Edna Gerken, supervisor of health education, Fall River, Mass. Miss Jean will spend several weeks in Japan conferring with educational and health authorities, and in Hawaii she will represent the American Public Health Association.

Miss Jean is a member of the Advertising Committee of the A. P. H. A., the Committee on Exhibits, and of the recently organized Committee on Cooperation, Development and Finance.

DR. GOLDBERGER DIES IN WASHINGTON

Dr. Joseph Goldberger, 55, world famed scientist, discoverer of the cause of and cure for pellagra, and a Fellow of the A. P. H. A., died January 17 in the U. S. Naval Hospital in Washington, D. C., following a long illness. The cause of Dr. Goldberger's illness had been undetermined, but an autopsy showed that all his vital organs had been attacked by a malignant growth.

Dr. Goldberger was born in Austria-Hungary and came to this country when he was 7 years old. He received his medical education at Bellevue Hospital Medical College and later interned at that hospital. He practiced in New York City and Wilkes-Barre prior to entering the U. S. Marine Hospital Service, which later became the U. S. Public Health Service.

Three times Dr. Goldberger's life was endangered, once while he was on duty

at the American Consulate in Tampico, Mex., when he contracted yellow fever, again when he was studying typhus fever in Mexico City, and another time while he was investigating an epidemic of dengue fever.

Fourteen years ago Dr. Goldberger began his research work in pellagra which resulted in his conclusion that pellagra is caused by improper diet and can be cured by correct diet.

In commenting upon his death Assistant Surgeon General Kerr said that Dr. Goldberger's experiments had been of great economic importance to the country and that his contribution compared with that of Dr. W. C. Stiles, who discovered the cause of hookworm infection, and Dr. Walter Reed, who discovered yellow fever.

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Elisabeth C. Hartmann, R.N., Dubuque, Ia., Staff Nurse, Visiting Nurse Association

Walter J. Imig, B.S., St. Paul, Minn., Bacteriologist, State Dairy and Food Department

Lawrence F. Lindgren, M.S., Lincoln, Neb., Instructor in Bacteriology and Pathology, University of Nebraska

Eschscholtzia L. Lucia, Ph.D., Berkeley, Calif., Assistant Professor of Biometry, Department of Hygiene, University of California

Frank J. Mara, Trenton, N. J., Investigator Mercer County Health League

Sarah B. Meyers, R.N., DeLand, Fla., County School Nurse

Frank W. Miller, New Brunswick, N. J., Associate Entomologist, New Jersey Agricultural Experiment Station

Louis Mitchell, B.S. in C.E., M.S., Syracuse, N. Y., Dean and Professor of Civil Engineering, Syracuse University

Claude A. Neavles, St. Louis, Mo., Director of Physical Education, Y. M. C. A.

Carmen P. Osler, A.B., Columbus, Miss., Instructor in Physiology and Hygiene, Mississippi State College for Women

Albert F. Porzelius, B.S. in C.E., Chattanooga, Tenn., Superintendent City Water Company

Herbert C. Schettler, Royal Oak, Mich., Food and Milk Inspector

Herbert A. Seymour, Chicago, Ill., General Secretary, Commonwealth Edison Mutual Benefit Association (Assoc.)

Robert C. Strode, M.D., Olympia, Fla., District Medical Officer, State Board of Health

Anna L. Tittman, B.S., R.N., New York, N. Y., Vocational Secretary for Public Health Nursing, Joint Vocational Service

Nelson P. Yeardley, M.D., Parkersburg, W. Va., School Physician, Parkersburg Independent District

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Conference on Influenza, January 10, 1929—A conference was called by Surgeon General Hugh S. Cumming in Washington, D. C., to discuss the influenza situation. This conference was attended by approximately 100 representative physicians and public health workers from all parts of the country. The resolutions adopted at the conference were drafted by three committees appointed for this purpose. One committee dealt with scientific research, a second committee dealt with preventive measures, while the third committee discussed epidemiological studies.

The following is the report of the committee on preventive measures:

REPORT OF COMMITTEE ON PREVENTIVE MEASURES

When influenza is prevalent or is believed to be approaching a community, during the course of an epidemic it is advisable to take advantage of the public interest and concern by emphasizing anew those public precautions and practices of personal hygiene upon which the prevention of communicable affections of the upper respiratory tract depends.

Measures for precaution fall naturally under those of a communal or administrative character and those which apply to the individual:

I. *Communal or Public Precautions*

1. Efforts should be made to reduce the opportunities of direct contact infection by avoiding crowds.

2. Schools or colleges should not be closed wherever adequate medical and nursing supervision is available and provision is made for the prompt exclusion of all persons showing suspicious catarrhal symptoms, especially when these are associated with a rise of temperature.

3. The reopening of boarding schools and colleges after vacation should not be encouraged in the presence of epidemic influenza unless there are generous accommodations for the bed care of those who may be attacked.

4. While the general closing of places of public assemblage is to be deprecated, there may be local conditions justifying such action at the discretion of the local health authorities.

5. In groups which can be brought under daily professional inspection the isolation of early and suspicious cases of acute respiratory tract infection, particularly when these are accompanied by rise in temperature, may result in delaying the spread of the disease.

6. In isolated communities and in institutions infection may be delayed and sometimes avoided by the strict exclusion of visitors.

7. The person and sick room of an infected individual must be considered a definite focus of infection, and visitations to such persons or premises should be avoided by all persons except the necessary medical and other attendants.

II. *Education in Cleanly Personal Habits*

When influenza prevails or threatens, information on the subject of cleanly personal habits and personal hygiene should be spread widely, particularly with regard to the following points:

1. Avoidance of all uncovered acts as in coughing, loud talking, sneezing or spitting.

2. Special emphasis upon the need of washing the hands frequently, more especially before eating; unclean articles and fingers should be kept out of the mouth and nose. This advice is particularly applicable to all persons in attendance upon the sick.

3. Avoidance of exposure, fatigue and any bodily excess.

4. Persons in good health should continue in their normal manner of life.

III. *Advice to Individuals for Guarding against Colds, Upper Respiratory Infections and Influenza*

It would seem advisable that in the presence of influenza or upper respiratory infections individuals should make more than the ordinary effort to increase well-being. This may be obtained by:

1. Securing adequate sleep and rest (8 to 10 hours' sleep every night with windows open, but under enough covering to keep warm).

2. Eating a moderate, mixed diet and partaking freely, at regular periods, of pure water (6 to 8 glasses daily).

3. Wearing clothing to suit the environment, particularly clothing which prevents chilling of the body surfaces and which keeps the body dry.

4. Avoiding people with colds, especially those who are sneezing or coughing. There is more danger from contact with those just beginning to feel sick than from those ill enough to be confined to bed.

5. Keeping out of crowds so far as possible, especially crowds in closed places.

6. Avoiding the use of common towels, wash basins, glasses, eating utensils, and toilet articles.

7. Washing the hands thoroughly before eating.

8. Avoiding the use of any so-called preventives. Vaccines, serums and advertised preventives seem to be of no value and may be harmful in this disease.

9. Avoiding alcohol and stimulants of all sorts.

IV. *What to do to Prevent Becoming Seriously Ill if You Get the Disease*

1. If you have a cold, feel ill, or are feverish, go to bed at once, cover up warmly and have the windows open; send for a physician and follow his instructions.

2. Do not take any so-called cures. There is no specific cure for this disease.

3. If you cannot get a doctor, remain in bed, eat a simple diet, take plenty of fluids, such as water, fruit juices, milk, bouillon, hot soups, at frequent intervals. Use a mild cathartic, if constipated.

4. Remember that the most important measure of preventing pneumonia or other serious complications is to remain in bed until all symptoms have disappeared and then, under the physician's advice, to return very gradually to your usual physical activities, being sure to rest before you get tired.

HENRY A. CHRISTIAN, *Chairman*,
THEODORE B. APPEL,
HAVEN EMERSON,
JAMES P. LEAKE,
FRANK SMITHIES,
H. F. VAUGHAN,
R. C. WILLIAMS.

Scarlet Fever—In 1925, 2,124 children in the Michigan Home and Training School were tested by the Dick method and 37.6 per cent found positive. These were immunized with 500 skin test doses followed by 1,000 to 1,500, and as a 3d dose 3,000 to 4,500. A re-Dick test 21 days later showed 61 per cent still positive. To these a 4th dose of 5,000 skin test doses was given. Fourteen days later 11 per cent were found positive. Additional doses were given until all cases except those lost track of gave negative Dick test. Three years later a retest of 577 of the original 799 children indicated that 29.3 per cent had changed from negative to positive.

In a smaller group immunized in 1926 with larger doses, it was found that 34 per cent had become positive by May, 1928. Although scarlet fever did appear among children later admitted to the institution and used as controls, and did in one instance occur in a child which had given a negative Dick test, the officers of the institution have concluded that scarlet fever has been controlled by such immunization. Since January, 1927, there has been no scarlet fever in the institution in which prior to the initiation of immunization scarlet fever was almost constantly present. The Michigan Department of Health has also used active immunization to prevent scarlet fever in other state institutions and with the coöperation of local physicians and health officers has given 8,000 1st doses and 6,900 3d doses in some 125 towns scattered throughout the state. Reactions have been watched very closely. About 7 per cent of susceptible persons treated will develop nausea after the 2d or 3d dose; about 4 per cent nausea, vomiting and purging, and about 2 per cent nausea, vomiting, purging and rash. The reactions are those of toxemia and are transitory,

seldom lasting more than 24 hours.—Guy L. Kiefer, The Value of Active Immunization against Scarlet Fever, *J. A. M. A.*, 91: 1885 (Dec. 15), 1928.

Infantile Paralysis in Massachusetts—In 1927 there were reported 1,189 cases of infantile paralysis in Massachusetts. The Harvard Infantile Paralysis Clinic at the Children's Hospital has been treating 636 of these cases, more than half of the total number. The epidemic affected the eastern part of the state, there being 277 cases in Boston and 111 cases in Haverhill. The incidence rate in Boston was 0.35 per 1,000, in Haverhill it was 2 per 1,000, while in Ipswich, a small town thirteen miles east of Haverhill, there were 26 cases with an occurrence rate of 4 per 1,000. The death rate in the 1927 epidemic was 14.2 per cent compared with death rates of 23.5 in 1916 and 20.7 in 1920. The average age of the patient was 5.4 years. Instances of more than one case in the same family occurred 32 times in 755 families, or 4.2 per cent. One family in Haverhill had 4 children affected, in 2 of whom the disease proved fatal.—A. T. Legg, An Analysis of the 1927 Epidemic of Infantile Paralysis in Massachusetts, *J. A. M. A.*, 92: 31 (Jan. 5), 1929.

Whooping Cough—A freshly prepared vaccine was administered to 100 patients subcutaneously. At first injections of 1, 2 and 3 billion of killed *B. pertussis* (Bordet-Gengou) were given at 3-day intervals. Later the dosage was increased to at least 3, 4 and 5 billion bacilli. The vaccine was prepared from newly isolated strains from typical cases. In none of the 100 children was the disease prevented, although quite a number of patients were given the vaccine very early. Five of 6 infants exposed to older patients in their households received 3 inoculations during the catarrhal or early paroxysmal stage, but all developed severe pertussis.

A study of cases indicated that a father, who contracted the disease from his barber, gave it to his 4-year-old son. There is also history of a patient of 6 having had whooping cough twice, the first attack being at the age of 2 years. In the second attack the Bordet-Gengou bacillus was found on the cough-plates.

White and differential blood counts were made on most of the patients. In complicated broncho-pneumonia counts were high but the proportion of lymphocytes was lower. In some mild but unquestionable cases the white cell counts never exceeded 10,000 per cu. mm. In no mild uncomplicated case was the count very high; in no severe case was it low.

Bordet's method of isolating the bacilli was employed. Of 34 cases 97 per cent were positive during the catarrhal stage of the disease. Of 50 cases, 50 per cent were positive in the paroxysmal stage. During the decline of the disease the bacilli were not found in any of 16 cases examined.

The high mortality rate in pertussis patients warrants recourse to all known means of early diagnosis. Infants and very young children should be protected from patients and exposed susceptible children. This can be done only by early quarantine. If health departments would include in their service whooping cough diagnosis by means of the cough-plate, an earlier diagnosis could be made and an earlier quarantine established.—L. W. Sauer and L. Hambrecht, Whooping Cough, *J. A. M. A.*, 91: 1861 (Dec. 15), 1928.

LABORATORY

C. C. YOUNG

FOOD POISONING BY BACTERIAL TOXINS

R. W. PRYER, D. P. H., FELLOW A. P. H. A.

State Department of Health Laboratories, Lansing, Mich.

IN MANY reported cases of food poisoning the rapid onset of symptoms has led skilled investigators to conclude tentatively that soluble, more or less heat resistant, toxins played an important rôle.[1]

The following report of a food poisoning case is believed to be an example of food poisoning by bacterial toxins with a reasonable amount of proof of the probable nature of the infecting organism despite the fact that viable organisms of any of the commonly accepted food poisoning group were never isolated.

In view of certain unusual incidents connected with this case, the two laboratories concerned will be referred to as Laboratory A and Laboratory B.

In March, 1926, a specimen of corned beef was sent in to Laboratory B from one of the smaller cities of Michigan with the information that the attending physician was quite certain that the meat in question had caused illness in a family. Laboratory B referred the letter and specimen to Laboratory A. The director of Laboratory A received the specimen and turned it over to analyst "X" for examination. Analyst "X," becoming convinced from a cursory examination of the meat that it was not the cause of the trouble, ate some of this meat and persuaded 3 others to do the same. As a result of this unofficial act, all 4 were taken ill in about 2½ hours with cramps, vomiting and profuse diarrhea followed by extreme prostration. All 4 were definitely out of danger in 24 hours and the result of the unofficial test was to convince all parties concerned that the offending article of food had been isolated.

The specimen of meat was then turned back to Laboratory B and the remainder of the bacteriological work done at that time was performed by analyst "Y."

The specimen as received by analyst "Y" consisted (as shown by his report) "of ⅝ lb. oblong loaf of corned beef together with fragments contained in large glass jar with clamp cover. Original tin container and lid were also received." Analyst "Y" reports that although "the meat appeared rather dark red in color, no unusual odor was observed." His conclusions after a considerable amount of work were as follows:

An unidentified aerobic streptococcus of the Gamma type (Brown's Classification) was found in large numbers throughout the specimen. A gram positive encapsulated, bile soluble, green producing, lanceolate diplococcus, which is not agglutinated or precipitated by pneumococcus antisera of types I, II and III, believed to be a pneumococcus of type IV, was found in moderate numbers.

Extract from meat specimen was found to contain a non-filterable (Mandler filter) substance toxic to small guinea pigs when injected in moderate to relatively large doses. . . .

The toxic effects produced by this specimen are believed to be due to the presence of an endotoxin in the organisms isolated from the specimen, no soluble exotoxin being demonstrable. This substance is apparently much more toxic for humans than for laboratory

animals, although guinea pigs died following the injection of relatively large quantities of the material. Smaller quantities produced severe but non-fatal toxic symptoms in these animals.

In December, 1927, 21 months after the specimen had been opened and caused these two outbreaks of food poisoning, the writer received this specimen for examination.

From the bacteriological standpoint our findings as far as viable bacteria are concerned agree very closely with those of analyst "Y." However, none of the cultures isolated give any suggestion of toxin production even when grown in corned beef media, and since organisms of this kind are not usually associated with food poisoning, the toxicity of filtrates of the meat was more fully investigated. Repeated cultures on Endo, brilliant green, blood agar and plain agar, both from fresh emulsions of specimens taken from the central portion of the meat and from enrichment cultures after 24- to 72-hour incubation periods, failed to show organisms of the paratyphoid group. It should also be stated that all animals dying from injection of the unfiltered emulsions of this meat were autopsied and blood cultures as well as peritoneal cavity cultures were made with entirely negative results as far as paratyphoid-like organisms were concerned.

In making up emulsions of this meat for animal experimentation, approximately 20 gm. were ground in a mortar with 100 c.c. sterile water and the mixture filtered through coarse filter paper. An emulsion of this strength would surely kill guinea pigs of 250–350 gm. weight in 3 c.c. quantities when injected intraperitoneally. Heating this emulsion did not appreciably affect its toxicity, as is shown in Table I.

TABLE I

Guinea Pig No.	Weight	Amt. Injected I.P.	Previous Treatment of Emulsion	Result
X141	350	3 c.c.	—	Death in >18 hrs.
X144	300	5 c.c.	—	Death in >18 hrs.
X66	250	5 c.c.	heated 70° C. 1 hr.	Death in >18 hrs.
X57	280	3 c.c.	heated 70° C. 1 hr.	Death in >18 hrs.
X74	330	3 c.c.	heated 100° C. 1 hr.	Death in >18 hrs.
#151	250	5 c.c.	heated 100° C. 1 hr.	Death in >18 hrs.

Following filtration through either a Seitz or Mandler filter the toxicity of an emulsion is markedly decreased, but such filtrates have caused death of guinea pigs following intraperitoneal injection.

The possibility of this toxic action being due to metallic substance was ruled out by a chemical examination.

The intravenous injection of rabbits with Seitz filtrates of emulsions of this meat and the titration of the agglutination power of their blood against various members of the paratyphoid group of organisms has given us an idea of the probable nature of the etiological factor concerned.

Rabbit No. V108—The normal blood showed no agglutination when titrated against the following organisms:

Cultures No. 511, 541, 542 *B. enteritidis*
526 *B. aertrycke*
509 *B. suipestifer*
501 Morgan's bacillus
512 *B. paratyphosus C*
B. typhosus
B. paratyphosus A
B. paratyphosus B

After 6 intravenous injections of increasing amounts of the Seitz filtrate of an emulsion of this meat, the serum of Rabbit No. V108 obtained 9 days after the last injection gave results shown in Table II.

This work indicates that the original infecting organism in the meat was one of the aertrycke group which had produced a heat resistant toxin.

Attempts to produce a higher titer serum were unsuccessful although a

TABLE II

	1–10	1–20	1–40	1–80	1–160	1–320
B. typhosus	–	–	–	–	–	–
B. paratyphosus A	–	–	–	–	–	–
B. paratyphosus B	–	–	–	–	–	–
B. enteritidis No. 511	–	–	–	–	–	–
B. enteritidis No. 541	–	–	–	–	–	–
B. enteritidis No. 542	–	–	–	–	–	–
B. aertrycke No. 526	++	++	+	–	–	–
B. suipestifer No. 509	++	+	–	–	–	–
B. paratyphosus C No. 512	–	–	–	–	–	–

number of rabbits were used in the trials.

This work would seem to indicate that the original infecting organism in the meat was either *B. aertrycke* or *B. suipestifer* and that the two outbreaks of food poisoning were due to a heat resistant toxin produced by this organism.

REFERENCE

1. Jordan and Falk. *The Newer Knowledge of Bacteriology and Immunology*, 1928, Chap. XXXV, p. 443.

STANDARDIZATION OF THE WASSERMANN TEST*

RUTH GILBERT, M. D., FELLOW A. P. H. A., AND ANNA M. SCHAIBLE

Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

FURTHER work was done in the standardization of antigens and complement used in the complement fixation test for syphilis. Since the fundamental basis for precipitation and complement fixation reactions is probably the same and the former test is being more and more extensively used, the comparative value of some of the more widely used precipitation tests was investigated. The results with the Kahn test, which has been given the most extensive study thus far, indicate that although it is somewhat more sensitive than the complement fixation test with the acetone-insoluble antigen, it is much less sensitive than the test with the cholesterolized antigen when the test is carefully standardized and controlled. The Sachs-Georgi and Meinicke tests which have been made are as yet too few in number to permit any definite conclusions. The reactions obtained with the Meinicke test indicate that it compares fairly closely with the Kahn test in sensitivity, while decidedly fewer reactions were obtained with the Sachs-Georgi test. No definite evidence of nonspecific reactions was obtained with any of the tests studied, if they were carefully controlled and the directions of the authors were followed in detail. The desirability of adopting a uniform complement fixation technic is urged, since aside from its chief value in increasing the accuracy of the information furnished the clinician, it would provide a standard for judging the reliability of precipitation and other tests for syphilis.

* Abstract of Referee's Progress Report for 1928 to the Committee on Standard Methods, presented to the Laboratory Section of the American Public Health Association at the Fifty-seventh Annual Meeting in Chicago, Ill., October 16, 1928.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The 1927 Life Table for American Workers—In 1927 the expectation of life at birth among industrial policy holders of the Metropolitan Life Insurance Company was 56.42 years as compared with 55.02 for 1926. A large part of the gain occurred in the early ages of life. The expectation of life at age 10 for white males was 51.88 as compared with 51.41 in 1926, and 51.63 in 1925. For white females the expectation of life at age 10 was 55.32 in 1927 as compared with 54.87 in 1926. For colored males, the corresponding figures were 44.99 in 1927, as against 44.84 in 1926; for colored females 46.34 in 1927 as against 45.60 in 1926. The expectation of life at age 20 for white males was 42.93 in 1927, and 42.49 in 1926. For white females the expectation of life at the corresponding age was 46.33 in 1927, contrasted with 45.87 in 1926. Among colored males the figures in 1927 were 37.08, and in 1926, 36.80; and for colored females 38.64 in 1927, and 37.97 in 1926. At age 30 the expectation of life among white males in 1927 was 34.44, contrasted with 34.02 in 1926. Among females, it was 38.05 in 1927, and 37.53 in 1926. The expectation of life for colored males was 30.05 in 1927, as against 29.91 in 1926; and for colored females 32.15 in 1927, as against 31.41 in 1926.—*Stat. Bull.*, Met. Life Ins. Co., 9: 2 (Nov.), 1928.

Health Gains among Negroes—A study of 2,500,000 negro Industrial policy holders of the Metropolitan Life Insurance Company showed that between 1911 and 1927 the mortality rate of negroes at all ages dropped 17.3 per cent as compared with 31.6 per cent for whites. The death rate among insured negro children 1 to 14 years of age showed between 1925 and 1927 an improvement of 38 per cent over the 3-year period between 1911 and 1913. The mortality of the whites improved 43.6 per cent for the same period. Between 15 and 24 years of age the negro gain of 28.8 per cent closely approached the 31.9 per cent gain of the whites. After the age of 25 the improvement for the negroes approximated only one-half that of the whites. Between the ages 25 and 34 the negro gain was 24.2 per cent whereas that for the whites was 42.7 per cent, and between the ages of 35 and 44 the negro gain was only 18.1 per cent whereas for the whites it was 39.8 per cent.

The greatest single factor in the improvement of the mortality rate of the negroes for the periods 1911 to 1913 compared with 1925 to 1927 was the decline in the death rate from tuberculosis. While the gain for all causes combined was 17.3 per cent, that for tuberculosis was 44.7 per cent. Among the negroes the greatest decline, 156.5 per cent, occurred in the 1 to 14 year group. The decline among whites for the corresponding group was 59.2 per cent. Between the ages of 15 and 64 years where the bulk of the deaths from tuberculosis takes place, the gains for the colored ranged from a minimum of 35 per cent to a maximum of 52 per cent. Among whites for the same age group the gains ranged from 49.8 per cent to 54.3 per cent.

The tuberculosis death rate among negroes insured in the Metropolitan's Industrial Department for the first 9 months of 1928 was 233.6 per 100,000, while that for heart disease was 233.9.

The tuberculosis death rate for colored policy holders in 1911 was 2¼ times that for heart disease.—*Stat. Bull.*, Met. Life Ins. Co., 9: 3 (Nov.), 1928.

Diphtheria Survey in Connecticut—A study of diphtheria deaths was made from September, 1923, to the end of December, 1926. The study included 370 deaths out of a total of 437 for the period. Of the 370 deaths, 143 were laryngeal in type and 125 of mixed type. More than half or 53.2 per cent of the deaths studied occurred in children under 5 years of age. Seven and three-tenths per cent of the deaths were among children under 1 year of age; 31.4 per cent within the 5 to 9 year age group; and 9.7 per cent within the 10 to 19 year age group.

In only 20 per cent of the 370 cases the doctor was called on the first day of illness. In nearly 40 per cent of the cases he was not called until the fourth day or later. Antitoxin was not always given as soon as the physician was called. Less than two-thirds of the cases received antitoxin on the first day, and no antitoxin was given to 22 of the cases. Of the contacts with the 370 fatal cases of diphtheria, 44.1 per cent were immunized. Thirty-six and five-tenths were not immunized, and in 9.4 per cent of the cases it was not stated whether immunizing treatment was given.—*Conn. State Dept. of Health Report*, 1927, pp. 88–97.

Vital Statistics of England and Wales—In 1927 there was an approximate of 200,000 in the population of England and Wales. There were 654,172 births and 484,609 deaths. The infant mortality rate was 70 per 1,000 births. There were outbreaks of enteric fever which caused an increase in cases from 2,739 in 1926 to 3,533 in 1927. Smallpox increased in prevalence from 10,146 cases to 17,767. In 1926 only 1 case occurred in Wales, whereas in 1927 2,442 cases were reported. Deaths occurred among 49 persons, 35 of whom were unvaccinated. There were 67,757 cases of pneumonia for the year, which resulted in 37,242 deaths. The number of deaths from all forms of tuberculosis was 83,173 as compared with 37,525 in 1926. There were 2,690 deaths in childbirth, and 1,026 of these were from puerperal fever.—The State of the Public Health, *Brit. M. J.*, 2: 753 (Oct. 27), 1928.

Chronic Disease in Boston—A study of chronic disease in Boston was begun June 1, 1927, by the Boston Council of Social Agencies. A survey was made of 4,316 chronic and incurable patients reported by Boston hospitals or social agencies. Between July 1, 1926, and June 1, 1927, 1,863 of the 4,316 patients were in hospitals for chronic diseases, 1,043 in general hospitals and 1,410 under the care of the Community Association and other social organizations. Males totaled 46.2 per cent; females 53.8 per cent. Seventeen and seven-tenths per cent of the patients were under 15 years of age; 7.3 per cent between 15 and 29; 33.6 per cent between 30 and 59; and 41.4 per cent were 60 or over.

There were 845 cases of heart disease, which constituted about one-fifth of the total number of cases. There were 553 patients with organic nervous and mental disease; and 534 with cancer. The chronic arthritis cases numbered 467; 4.9 per cent of these cases were under 20, and 36.4 per cent under 60. The non-pulmonary tuberculosis group numbered 196; children under 14 made up about 58.5 per cent of this group. There were 138 patients with fractures and burns, and 135 with infantile paralysis. At the time of the study 85.2 per cent of the patients were known to have been ill more than 3 months, and 2,340 of the total 4,316 were ambulatory. Of the 3,127 chronic and acute

patients occupying beds in the 18 general and special hospitals on the census day, 4.9 per cent had been occupying, for more than 3 months, beds designed and maintained for acute cases.

At the time that the study was ended, 18.2 per cent of the 4,316 patients were still in hospitals; 18.8 per cent were under the care of agencies; 10.8 per cent had died; 46.8 per cent had been discharged; and the location of 5.4 per cent was unknown. Of all the chronic sick cared for by the hospitals for chronic diseases, 17 per cent were reported as full pay patients, 15.8 per cent were paying in part, and 67.2 per cent paid nothing.—Survey of Chronic Disease in Boston, Mass., 1927, *New Eng. J. Med.*, 199: 556–574; 620–632 (Sept. 20, 27), 1928.

Health Conditions in the Soviet Union—According to the census of 1926 the population of the Union of Soviet Socialist Republics was 145,806,624. In the Russian Socialist Federated Soviet Republic, one of the most important units of the Soviet Union, there was in 1925 a birth rate of 47.0 and a death rate of 25.9. This gives a natural increase of 21.1 per cent. In the White Russian Socialist Soviet Republic, another unit, the birth rate was 41.0 and the death rate 18.6, a natural increase of 22.4 per cent. In the Ukranian Socialist Soviet Republic the birth rate was 31.5 and the death rate 13.8. These figures may be compared with a birth rate of 21.4 and a death rate of 11.8 in the U. S. Birth Registration Area. The deaths of infants per 1,000 births numbered 213 in the R. S. F. S. R.; 125 in the White Russian S. S. R.; and 146 in Ukranian S. S. R. Contrasted with these is the infant mortality rate of 72 in the U. S. Birth Registration Area.

In 1925 the U. S. S. R. reported 115.2 cases per 100,000 population for typhoid fever; a case rate of 12.7 for smallpox; 450.2 for measles; 186.8 for scarlet fever; 241.8 for whooping cough; 49.4 for diphtheria; 1,957.3 for epidemic influenza; 838.6 for tuberculosis; and a case rate of 347.3 for syphilis.

No figures are available showing mortality by cause in the entire Soviet Union, but there are figures for the city of Moscow. The death rate in Moscow in 1927 was 13.5 per 1,000 population whereas in New York City it was 11.8. Moscow had a death rate of 40.8 for measles in 1927 and New York had a rate of only 0.6. There was a death rate of 19.6 from epidemic influenza in Moscow and 10.6 in New York. The rate for tuberculosis was 157.1 in Moscow, and 86.1 in New York. The rate for cancer was 101.3 in the former city and 124.9 in the latter, and the death rate from syphilis was also lower in Moscow, being 2.1 as compared with 9.2 in New York City. The death rate from puerperal causes was 27.1 per 10,000 births in Moscow, whereas New York showed the much higher rate of 51.3.—J. V. Deporte, *New York State J. Med.*, 28: 1403 (Dec. 1), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Report of the Committee on the Collection and Disposal of Refuse *—The Committee on the Collection and Disposal of Refuse † has had insufficient time since its appointment to prepare a report of permanent value for the 1928 meeting of the Association and after due deliberation concluded it would render better service by recommending a subject for a report at the 1929 meeting to be transmitted to next year's committee after its appointment.

Several subjects suggested at first were finally believed to have been sufficiently covered in earlier reports or textbooks and others seemed better adapted to presentation in the form of a paper or address. After various interviews and correspondence the committee decided to recommend as a subject for the report by next year's committee: "The Collection of Garbage."

Progress Report of the Committee on Water Supplies *—The Committee on Water Supplies † was reorganized such a short time ago that it was impossible to take up some subject and make a report at this meeting. The chairman has been in correspondence with the other members of the committee and we have considered taking up two subjects. One is the relative portions of the burden of pollution which should be assumed by those producing pollution and by the water works or others using the water. The other is bacterial after-growths in water distribution systems. We hope to be able to report on one or both of these problems next year.

Progress Report of the Committee on Sewage Disposal *—The chairman was given to understand soon after the meeting last year in Cincinnati that not much would be expected of the committee † this year. Two brief papers, however, are offered, one by Frank Bachmann entitled "Observations on pH Control of Separate Sludge Digestion Tanks," and the second, by Harrison P. Eddy, entitled "An Account of Legal Action Brought against a Municipality for the Discharge of Filtered Sewage into a Small and Otherwise Unpolluted Stream."

The committee has been asked to suggest a line of work for next year's committee and, in compliance therewith, reports as follows:

During September and October, 1928, suggestions have been received from all the members of the committee. An informal vote upon these suggestions has resulted in a majority favoring for first choice: "The Disposal and Utilization of Sludge," and for second choice: "The Preparation of Standard Forms for the Reporting of Statistical and Operating Data."

One of the suggestions was received too late to take it up further with the committee. I am therefore submitting the above as it stands for the assistance of next year's committee.

Progress Report of Committee on Mosquito Control *—Several changes in the personnel of the Committee on Mosquito Control † were made during the past summer, and the committee did not have the opportunity to organize and conduct any investigations as a

* Presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

† Committee chairmen will welcome suggestions from members of the Section or the Association.

basis for a report at this meeting. The committee has adopted a program for 1929, which embraces the investigation of the phases of mosquito control set forth below and, subject to the approval of the Council, proposes to present, through the medium of a committee report and a special paper by someone qualified to discuss the subject selected for that purpose, those phases which have been satisfactorily developed at that time.

1. Effective and economic oil mixtures and larvicides
2. Improved practical control methods such as the use of mechanical equipment for ditch cutting and maintenance, applying oil and larvicides, etc.
3. Use of repelling agents for protection against mosquitoes on the wing
4. Publicity programs for arousing much needed individual activity in the control of breeding on private property and securing favorable action of legislative and appropriating bodies
5. Essential public health and economic values of general mosquito control
6. Variations in life habits of mosquitoes as they affect practical control

The following brief statement of the considerations which have prompted the selection of the program are given in amplification of the foregoing summary.

It is the general opinion of many experienced workers that oils now available for mosquito control purposes are not of uniform efficiency; that considerable money and time are frequently wasted on this phase of control due to the lack of knowledge of the effectiveness of oils and oil mixtures with their varying degrees of spreading properties, surface tension, toxicity, etc.; and that a product of certain selected specifications should be adopted. Much experimental work along this line has been done in New Jersey during the past year.

New methods develop from time to time. The use of mechanical equipment in several branches of control work has increased in the last two or three years. Where applicable, such equipment in its several forms is a decided economy and is worthy of study.

Knowledge of the effect of repelling agents upon mosquitoes, in the use of which freedom from attack may be obtained, would appear to be of great economic importance. The benefits of absolute protection from mosquitoes, the breeding of which for any reason is not controlled, would be immeasurable in disease prevention. Much progress has been made recently in this line of research, but no definite practice has as yet been established.

In the matter of publicity and education of the public the committee will endeavor to select or develop programs which may change indifference or hostility to active interest and support and which will demonstrate that the attitude of the public in favor of mosquito control demands that a full measure of protection be provided for by legislative and appropriating bodies.

The fifth item is linked up with the preceding one. The sixth is held to offer some practical possibilities.

Airplanes and Paris Green in Control of Anopheles Production—A description is given of the spread of Paris green by airplanes at Quantico and Chopawamsic Bays, Va. Four charts illustrate the decline throughout the summer of the production of adult anopheles in the treated localities and compare such production with that of a controlled, non-treated locality of Aquia Bay. For use in airplane dusting a dilution of 33 per cent of Paris green in powdered soapstone proved most satisfactory for all conditions. In calm weather an excellent distribution of dust was obtained at a height of 150 to 200 feet above the water. The dust penetrated all types of vegetation indigenous on the Atlantic coast.

Suitable intervals between dustings varied with the season: at Quantico they ranged from 6 to 13 days. The ma-

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Catarrhal Prophylaxis in Industry—The published results taken as a whole do not bear out the advertised claims of the manufacturers and venders of stock vaccines. The author tested anticatarrhal vaccines of proprietary manufacture on 79 persons, half of whom were factory staff and half clerical staff, controlled by a corresponding number of persons under exactly similar conditions of employment. In the experimental group 51 per cent developed acute coryza and only 25 per cent in the control group. There was evidence to show that those in the inoculated group were more susceptible to colds. "It would seem to follow, therefore, that the method of giving 3 inoculations at weekly intervals may actually increase the incidence of epidemic coryza," but longer intervals might decrease the same. While better results might obtain from autogenous vaccines, such are not prepared on a large scale and have limited use.—N. Howard Mummery (England), *J. Indust. Hyg.*, X, 9: 295 (Nov.), 1928.

Spray Painters in Automobile Refinishing—Author's conclusions:

Distinct physical defects attributable to benzol are very evident from this study. Of 24 men examined, 7, or 29.1 per cent, showed a blood picture of abnormally low leukocyte count; this finding was not confined to the men directly exposed to the spray. Abnormally high leukocyte count, high red blood cell count, and decreased hemoglobin percentage were also in evidence. In 5 workers, or 20.8 per cent, the spleen was palpable—a surprising percentage and a condition not before clinically reported in such an investigation. Pallor was common, though in some cases with high red counts the complexion was ruddy. Chronic bronchitis, phthisical appearance, and nasopharyngeal irritations were also in evidence. Physical appearance, length of exposure, and the presence or absence of subjective complaints are not indicative of the presence or absence of blood or physical changes or of their severity. Sprayers immediately exposed to sprays or those indirectly exposed may be affected. The blood picture and physical condition before entering this trade must always be kept in mind.

Among other things the author recommends thorough physical examinations and blood examinations every 3 months, with the exclusion of those with anemia or leukopenia, tuberculosis, chronic bronchitis, asthma, myocardial and valvular disease, nephritis or blood dyscrasia. These measures should include those even indirectly exposed. Spraying mixtures should be chemically examined for the presence of benzol. Efficient ventilation must obtain and rooms should be enclosed.—Jerome Meyers (New York City), *J. Indust. Hyg.*, X, 9: 305 (Nov.), 1928.

Some Queries about Respiratory Disease in Industry—More than half the lost time in industry is caused by respiratory disease. A brief study in the Edison Electric Illuminating Company of Boston, for the years 1915 to 1924, showed that 70 per cent of the respiratory diseases were colds and other diseases of the nasal fossae. Community studies show that this condition is not peculiar to industry but the disability varies enormously from plant to plant. The death rate from pneumonia in Akron, O., during 11 years was only 138, while in Youngstown, only 53 miles away, it was 268. The cause is evidently some unknown non-industrial factor. A number of questions arise

such as variations in the medical service supplied, the preventive health features in force, the higher temperatures or change of temperature in certain trades, such as the steel industry, etc. From studies in the cotton weaving industry, variations in humidity would not seem to be a factor, but these workers are afflicted above the average, while woolen workers in similar processes without heat and humidity exposures are afflicted below the average. In some processes the cotton workers have three times the respiratory rates prevailing in others. The study of various trades shows that the worst respiratory mortality is among those subjected to silica dust, less notably those exposed to other dust, those exposed to heat and temperature changes, and, least notably, those exposed to weather conditions. These same trades have the worst mortality from "all causes," including other diseases such as the circulatory group, digestive system, and the kidneys. It would seem that (1) hot moist processes are not nearly so productive of respiratory mortality as dusty trades; (2) pneumonia is especially bad in furnacemen, those in dusty processes, stevedores, and dock laborers. Findings of iron foundry workers by the Metropolitan Life Insurance Company are similar. For the most part the organic dusts are not so harmful as the inorganic.—R. M. Hutton (Canada), *J. Indust. Hyg.*, X, 9: 297, 1928.

Phosphorus Necrosis in the Manufacture of Fireworks—The use of the dangerous white (yellow) phosphorus without due precautions as shown in various fireworks plants in the country has enabled the author to collect the medical histories of 14 cases, descriptions of several of which are given with photographs showing the deformities present. In the three chief plants 366 persons were employed, 181 men and 185 women. Two of the 14 cases were fatal. The manufacturers themselves were experimenting for a less dangerous substitute and one advocated the prohibition in the industry of white phosphorus. Finally the resolution commending the efforts of the U. S. Department of Labor was passed January 30, 1926, by the U. S. Fireworks Manufacturers' Association agreeing to eliminate white phosphorus from the fireworks industry, the same to take effect on or before August 15, 1926. It is expected that cases of this affliction will now be eliminated. New York State is working on a code prohibiting the use of phosphorus fireworks.—Emma France Ward (Baltimore), *J. Indust. Hyg.*, X, 9: 314 (Nov.), 1928.

A Plan of Medical Service for the Industrial Worker and His Family * —The author outlines an elaborate plan undertaken by the Endicott-Johnson Corporation in the three towns in which its plants are located for lessening the disproportion between wages and the cost of medical care. The average annual wage of 30,000,000 industrial workers in the United States in 1925 was $1,250, not enough to provide for adequate medical service. The ideal plant must provide organized medical service and social service of considerable complexity and experience. It should not be arbitrary or compulsory, but competent. It must be flexible.

The Endicott-Johnson plan has been in operation and has proved practical for 15,000 workers in shoe factories and tanneries where the average annual wage is $1,441. There are 28 full-time physicians, 3 full-time dentists, 1 half-time dentist, 5 dental hygienists, 67 full-time trained nurses, 4 pharmacists, 2 bacteriologists, 2 laboratory technicians, 2 physical therapeutists, 1 roentgenologist, 6 motor ambulances, 16 clerks and

* Abstract of paper read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

20 other helpers; and, as occasion requires, specialists, nurses, and hospital arrangements. The service is offered to all workers and their dependents, the potential number being about 60,000 persons. The entire expense is borne by the company. "Increased individual production, and profits as the result of this plan, cover the cost."

Preventive medicine is offered in correct feeding, formation of health habits, and the use of vaccines and serums. A rest home in the country is maintained for debilitated girls and women, and a tuberculosis sanatorium at Saranac Lake, N. Y. A workers' sick relief association has 12,000 members and pays a weekly benefit of $10.50, supported with premiums of 20 cents a week. Accident hazards are kept at a minimum by careful supervision. There are no characteristic industrial hazards. Cost of the operating plan for 1927 totals $1,076,809, of which salaries amounted to $301,001, medical bills $193,480, outside service $294,586, and relief $287,742. At the rate of 2.5 cents for each of the 32,000,000 pairs of shoes manufactured by these workers the cost of their medical care can be covered.

DISCUSSION

Dr. T. R. Crowder (Chicago)—What are the difficulties that arise as obstructions on the part of the community and the local physician? Is this an economic procedure? The employe should pay at least a part of the cost. We need a study of the causes and sources of so much illness more than we need curative care.

Dr. V. S. Cheney (Chicago)—We are trying to do too much in industrial work. Other physicians must be considered. The employe should be made to look after himself. His health is what he is selling to the industry.

Dr. S. W. Welch (Montgomery, Ala.)—It is not any part of public health activities to treat the sick. Every man ought to be stimulated to take care of himself.

Dr. E. F. Cody (New Bedford, Mass.)—Has not this company had embarrassing labor difficulties?

Dr. George H. Bigelow (Boston)—This company is doing away with waste, including the waste from disease. It apparently finds it profitable to spend more than $1,000,000 per annum in this direction. It is not a question whether this system recognizes adequately the dignified position of the health officer or the dignified position of the medical practitioner; such is not disturbing the directors of the Endicott-Johnson Corporation.

Dr. W. C. Woodward (Chicago)—A knowledge should be at hand of the terms on which the medical and nursing staffs are employed; of the wages paid to employes in comparison to similar establishments; whether food, fuel and clothing are bought in bulk and issued to employes, and if not, why not, if medical service is furnished. This must be reviewed as a practical social problem. We should be told whether this is also profitable to employes and to the community.

Dr. Louis I. Harris (New York)—It is a question whether the worker is getting all the wages that he is entitled to. Under a system of medical care such as the one outlined, there is not the slightest danger of pauperization when the average wage is only a little more than $1,400 among 15,000 employes. Still are they getting an adequate wage? The plan is one of the varied experimental efforts to compensate for the lack of an adequate system of general medical service, because thus far a statesmanlike approach has not been made to this community problem. The questions should be dealt with in a socially minded way.

Dr. Daniel C. O'Neil—I expected the announcing of this plan here to start something. The worker whose average

wage is only $1,200 for the maintenance of a family is practically pauperized. Our scheme is not compulsory and a limited number of our workers do not avail themselves of the service, and they are not discriminated against. Our average wage below the rank of foreman last year was $1,441. The average wage paid to workers in the shoe industry in general in 1925 was $950.00. We do not furnish food, fuel, rent, and clothing in a wholesale manner, but only to those who suffer misfortune and need such assistance. Likewise our medical service is only for those who need it and who ask for it. Reference is made to the vital statistics of our communities which are in the office of the New York State Department of Health. I recall that our birth rate is nearly double that for upstate New York. Our relations to local physicians and the community are satisfactory and mutually helpful. Medical charity is lifted from them. Opportunity to receive postgraduate instruction is provided.—Daniel C. O'Neil (Binghamton, N. Y.), *J. A. M. A.*, 91, 20: 1516 (Nov. 17), 1928.

Near Vision and Illumination in Industry—Defective products should be charged to (1) raw materials, (2) mechanical factors, and (3) the human factor. Secretary Hoover's Committee on the Elimination of Waste in Industry reported large loss when the eyes are not given proper care. The most vital factor in this is light. The Travellers Insurance Company reports that 24 per cent of 9,100 accidents were caused directly or indirectly by improper lighting. More than 50 per cent of our population suffer from defective vision. More than 25,000,000 are involved in industry. We have found that 18.7 per cent of workers between 22 and 60 years have defective near vision. Eye fatigue can be practically eliminated by proper lighting and correction of refractive errors in the eyes. The efficiency of the individual is increased when 20 minutes rest time is allotted, and the quality of the work may be increased as high as 100 per cent. Our present analysis covers 16,000 employes and the accompanying charts are self-explanatory. Ten to 12 foot candles of light are thought to be the best illumination for close work. Corrected vision and illumination decrease accidents. Lighting should be free from glare and have enough intensity to produce the greatest visual acuity without fear of eye strain, and with short rest periods.—In the discussion, Dr. A. L. Brown said that poor illumination produces muscular imbalance (of the eyes) and is probably responsible for more distress than errors of refraction. Intensity of illumination should vary with the color of the material worked upon, white reflecting from 50 to 70 per cent of light and black only from 2 to 5 per cent.—P. A. Davis, *Ohio State M. J.* (Nov.), 1928, 6 pp.

Legislation on Occupational Diseases in Bolivia—The law passed April 18, 1928, covers (among other needs) various poisons and pathological conditions such as pneumonoconiosis, anthracosis, hydrocarburism, tobacco poisoning, pulmonary sclerosis, nephritis, and pulmonary tuberculosis, which are considered as occupational diseases. Compensation is paid (1) when the disease is contracted in the exercise of the occupation; (2) when the disease is due to the type of work done by the patient during the year preceding disability; (3) when the worker had not suffered from the disease before employment. Those who are principally exposed to pneumonoconiosis will be entitled to 30 days' annual holiday with full pay.—International Labor Office (abstracted from *Monthly Labor Review*), *U. S. Bur. of Labor Statistics*, 27, 5: 67 (Nov.), 1928.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Investigation of the Anti-Bacterial Resistance of Rats with Experimental Rickets—References are given of the observations of previous workers as to the lessening of the resistance toward infection in the case of vitamin deficiency. This investigation was undertaken for the purpose of measuring as specifically as possible the actual degree of resistance to known infection in the case of rats with experimental rickets. The rats, 30 to 35 days old, were placed on the McCollum 3143 diet, slightly modified by the authors, for 5 to 7 weeks. The diet was sufficient in vitamin A and the lack of balance between the calcium and phosphorus was made up by adding monocalcium phosphate in measured amounts. The infection was a strain of *B. suipestifer* introduced by intraperitoneal injection. The minimum lethal dose of this organism was determined both on normal rats and on those with experimental rickets, in the first case being between 22 and 24 million germs and in the latter about 3 million per gram of body weight. The authors showed at the outset that cod liver oil and irradiated sesame oil added to the rachitic diet increased the bacterial resistance. As controls, rats were used on the McCollum diet alone, on a rachitic diet with sesame oil irradiated, and finally normally fed rats. The sesame oil was irradiated by the Bach "Höhensonne" in a layer 1 mm. thick with the lamp at a distance of 30 cm. A number of tables are given showing the results with the different additions to the diet in varying percentages and in combination. The various experiments afford the conclusion that the anti-bacterial resistance of white, normal growing rats toward *B. suipestifer* is 7 to 8 times greater than the resistance of rats of the same age which have been made rachitic by the McCollum diet. The resistance of the rats with experimental rickets can be raised three to fourfold by the addition to the rachitic diet of 3 per cent sesame oil irradiated an hour with the "Höhensonne," or by the addition of 3 per cent cod liver oil. With the addition of 6 per cent sesame oil irradiated for an hour, or 3 per cent irradiated 3 hours, a further increase of the anti-bacterial resistance is not achieved. The anti-bacterial resistance is not increased or cannot be detected when the phosphate deficit in the diet is restored, by irradiation of the rachitic rats with the "Höhensonne," or by a fast of four days' duration. By irradiation normally nourished, growing rats do not show any increase in anti-bacterial resistance compared to normal rats of the same age not irradiated.—Dr. E. Maurer and Dr. P. Hofmann, *Arch. f. Hyg.*, 100, Band 8. Heft, 1928, p. 25.

The Presence of Arsenic in the Fish Organism—In arsenic poisoning the greatest amounts of arsenic are found in the liver and the kidney. In the ordinary articles of the diet, only fish contain arsenic in sufficient amounts to be definitely determined. The Swedish Arsenic Commission found the cod contained from 4.1 to 0.5 mg. of arsenic per kg. of body weight and the herring 0.4 to 0.8 mg. The authors sought to determine whether in the case of fish the arsenic is present in greater amounts in the liver than in the muscle tissue as is the case in human poisoning. In two

experiments on the cod, there was present in the liver 0.7 and 3.2 mg. arsenic per kg. and in the kidney 0.4 and 0.8 mg. per kg., indicating the preponderance in the liver. To determine whether the arsenic exists in the fish or the oil of the fish, raw cod liver was analyzed as well as the alcoholic extracts. Cod liver oil yielded 3.9 mg. per kg. of arsenic and the alcoholic extract contained 44 mg. per kg., the fatty acids of the alcoholic extract 250 mg. per kg. and the alcoholic extract of the residue after vacuum distillation of the fatty acid yielded 1,000 mg. per kg. The muscle tissue of the eel exclusive of certain organs was examined but arsenic was found in such minimal amounts as to warrant no definite conclusion. The muscle tissue of the herring yielded 2 mg. per kg. of the arsenic and the material of the ether extract 9 mg. per kg. The conclusion is reached that the arsenic is normally present in the fat soluble combinations. These are soluble in the usual fat soluble media but with difficulty soluble in water. The concentration of arsenic is greater in the liver of fish than in the muscle tissue. Also the arsenic is present in the oil separated from the muscle tissue and obviously in greater concentration in the extracted oil than in the tissue residue. It may be ascribed to the dissimilar composition of the food of these fish. A discussion is given as to the probability of the combination of the arsenic in the organism of poisoned mammals. According to Heffter there are three hypotheses, the lecithin hypothesis in which arsenious acid is supposed to substitute the phosphoric acid of lecithin; the nuclein hypothesis in which arsenic in a corresponding fashion is supposed to substitute the phosphorus of nucleic acid, and the keratin hypothesis which derives its name from the fact that arsenic is partially eliminated by the nails and hair. Comparison of the records of the presence of arsenic in the case of poisoned mammals and its presence in fish as found in these experiments has led to the conclusion that in the two classes the relationships are dissimilar.—Erik Sadolin, *Biochem. Ztschr.*, 201, Band (Nov.), 1928, p. 323.

Vegetable Food as a Source of Iodine—The very close correlation between the distribution of iodine and the existence of goiter in the United States has prompted a study of some of the vegetable foods in South Carolina, which is practically free from goiter. Investigations so far conducted on vegetables grown in this state indicate that they contain enormous amounts of iodine. Fellenberg reports the amount of iodine necessary to maintain equilibrium in a man is 14 micrograms. Some of the South Carolina potatoes contain enough iodine in a single four-ounce potato to furnish the 14 micrograms. The leafy vegetables are also rich in iodine, beet tops and lettuce running as high as one thousand parts per billion.—Roe E. Remington, *Science*, 68: 590 (Dec. 14), 1928.

Protein and Vitamin B—Reports of investigators as to the varying tolerances of experimental animals to high protein diets suggest that the unfavorable effect observed by some is not due to that factor alone but to the deficiency of some factor or lack of balance. The relation between protein and vitamin B is suggested. Experiments were conducted with rats on a basal diet of edestin, potato starch, butter, salt mixture and distilled water, with no restrictions on the amount of food and water consumed. Rats were weighed daily for the first 4 weeks and afterwards 5 days a week. Experiments are recorded in which this basal diet was supplemented with varying amounts of marmite and growth curves are given both for the experimental rats and those in which the protein was caseinogen or egg-albumin. The results show that the

20 per cent edestin diet with the 5 per cent yeast extract per 100 gm. solid was responsible for the death of many young rats with kidney symptoms but that the older rats were not affected. The symptoms can be prevented by the addition of more yeast extract and the protective factor in this extract is not destroyed by autoclaving at 120° for 4½ to 5 hours. Somewhat less yeast extract is necessary when caseinogen or egg-albumin is substituted. It is suggested that the different proteins may require varying amounts of vitamin B in order to secure proper metabolism.—Gladys Annie Hartwell, *Biochem. J.*, 22: 1212, 1928.

The Effect of the Cow's Ration on the Vitamin A and Vitamin B Content of Milk—Comparisons were made from milk of cows on both a high and a low protein ration. The high protein ration had a nutritive value of 1 : 2 and the low protein ration a nutritive ratio of 1 : 13. To determine the vitamin A content, young albino rats were fed on a vitamin A deficient diet until loss of weight occurred and the diet was then supplemented with milk from each of the groups of cows. Two c.c. of milk caused the resumption of growth in each case and 8 c.c. restored excellent growth. Vitamin B was tested similarly on rats and it was found that 15 c.c. of milk from normal cows and 16 c.c. from high protein cows and 18 c.c. from low protein cows permitted uninterrupted growth over an 8-week period. While the differences are small, the conclusion is reached that the milk from low protein cows contains less vitamin B than that from either the high protein or normal cows. While some recent experimental work has indicated that the presence of vitamin B in milk is not dependent upon the ration but is manufactured in the cow's paunch, the author concludes that this activity is influenced by the feed consumed and this may explain the difference in vitamin B content in this test. It is apparent, however, that a cow can tolerate a very low level of protein feeding without materially affecting the vitamin A and vitamin B of the milk.—W. E. Krauss, *Ohio Agri. Exper. Sta. Bull.*, No. 135 (Nov.–Dec.), 1928, p. 198.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

MATERNAL AND INFANT MORTALITY*

JULIUS LEVY, M. D., FELLOW A. P. H. A.

Bureau of Child Hygiene, State Department of Health, Trenton, N. J.

I. INFANT MORTALITY

MORTALITY UNDER ONE MONTH IN PRINCIPAL COUNTRIES

When charted several interesting features are indicated. In the first place, we see that the neonatal mortality varies considerably among the great countries of the world. This fact in itself is probably the most important fact to be brought out, for if it varies considerably, we are justified in believing that it is in our power to influence and to some extent control the neonatal mortality.

The United States with a neonatal mortality rate of 37.8, while not among the countries with the very highest neonatal mortalities, is to be found, however, among the upper third highest neonatal mortality rates. Attention is called to the low rate reported for Netherlands, 23.6. Similar rates are reported for New Zealand, Irish Free State, Australia, Denmark, and Belgium, all of which present neonatal mortality rates below 30. The rate for the United States is more than 50 per cent higher than that for Netherlands.

Another factor may be emphasized that we hope the committee will be able to clarify. The country with the lowest neonatal rate appears to be Egypt. From our general knowledge of conditions in Egypt, we are not disposed to believe this rate to be correct, and yet it must be included in this report, as it is based upon the official available statistics. We hope in the next report to be able to point out whether this fact is a true one and one to be used in comparison with the other countries.

I might mention here that when we come to discuss the maternal mortality we will find that the same countries which present a low neonatal mortality present a low maternal mortality. Apparently those factors which make for a high maternal mortality at the same time make for a high neonatal mortality. I would immediately make the deduction that any attempt to reduce neonatal mortality will have to deal with the problem of obstetrical care.

TREND OF INFANT MORTALITY

There has been practically no reduction in the mortality under 1 day since 1918. As a matter of fact, statistically there has been a slight rise.

When we take the mortality under 1 month for the same period, we find a percentage fall per year of 1.6, which is a very slight decrease. The reduction in the infant mortality under 1 year has really occurred in the period between 1 month and 12 months, a percentage fall per year of 5.7.

* Abstract of Report of the Committee to Report on the Status of Maternal and Infant Mortality, presented at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association and the American Child Health Association at Chicago, Ill., October 16, 1928.

Again, the fact is emphasized that the methods which have been found effective in reducing infant mortality apparently have had and will have very little effect upon the *early* infant mortality. Now, as it appears that the mortality in the first month of life, and particularly the first week of life, is a large proportion of the total mortality in the first year, it will become clear that any hope of further reducing infant mortality must be found in the efforts that will be directed to this early period.

INFANT MORTALITY BY MONTHS OF AGE IN THE FIRST YEAR OF LIFE

Here is shown the importance of the mortality in the first month. We see that the mortality in the first month, which is 37.9, practically equals the mortality of the succeeding 11 months.

AGE FACTOR IN INFANT MORTALITY

Half of the deaths of the first year occur in the first month, and half of the deaths of the first month occur in the first day, and half of the deaths in the first day occur in the first 3 hours. Therefore, it is very clear that no method of distributing modified milk, establishing mothers' classes, and visiting new-born babies can have a very marked effect upon this mortality, as it is obviously bound up with the obstetrical problem.

INFANT MORTALITY BY HOURS OF THE FIRST DAY OF LIFE

It is clearly evident that if we are going to reduce further infant mortality, we must reach the causes that are effective in the first 24 hours, for in this period one-half of all the deaths under 1 month occur and practically 15 per cent of the deaths under 1 year.

In passing, I would mention that there has been a recent tendency to separate prenatal work from general child hygiene and the infant mortality problem. I believe those who feel responsible for infant life must deal with the prenatal and obstetrical problem.

FIRST DAY'S MORTALITY BY TYPE OF ATTENDANT AT DELIVERY

We find that the mortality in the first day for babies delivered in hospitals was three times as great as for those delivered at home; that the mortality for infants delivered by internes was twice as high as for those delivered by private physicians in hospitals; that among babies delivered at home the mortality for those delivered by physicians was almost twice as high as for those delivered by midwives; that for the entire group the mortality for those delivered at home by midwives was 5.6, while for those delivered in hospitals it was 21.8. Immediately these data present several questions for further study.

Is this high mortality among infants delivered by physicians, and particularly those delivered in hospitals, a coincidence or is there a definite relationship? Is the lower mortality found among infants delivered by midwives and in the home determined by the type of case and the type of woman who comes into the hands of the midwife, or is it due to the greater patience exercised by the midwife? Does the mortality among infants in the first day vary considerably according to the order of pregnancy? What conditions may be obtaining in hospital practice that would explain this very high mortality?

CHANGE IN SEASONAL INCIDENCE OF INFANT MORTALITY

Here we find that in the period, 1913–1914, a very high peak of mortality appears in July and August. When we contrast with this the mortality in 1926–1927 we find not only a complete disappearance of this peak, but a valley, so that it would appear an infant is safer in the summer months now than in the winter months.

RESPIRATORY DISEASES VERSUS DIARRHEA AND ENTERITIS IN INFANTS

We are able to point out that the great reduction of the summer mortality in the past decade is due to a lessening of summer diarrhea. In 1915–1916, summer diarrhea represented 23.5 per cent of the total deaths under 1 year, while in 1925–1926 it represented only 13.7 per cent. As diarrhea occupies a less important place in the mortality of the first year, the respiratory diseases rise in importance but only to a very slight degree. Recalling what has been said about the neonatal mortality, it becomes clear that the mortality of the first year is now mainly due to the diseases associated with the neonatal period.

II. MATERNAL MORTALITY

DEATHS PER 1,000 LIVE BIRTHS

A study of maternal mortality throughout the world shows that the United States presents the second highest mortality for all puerperal conditions and the fourth highest for puerperal sepsis. In contrast with the rate of the United States, which is 6.7 for all puerperal conditions, we would call attention to Netherlands, Norway, Sweden, and Italy, which present rates below 3 per 1,000 live births.

PUERPERAL SEPSIS MORTALITY

There is some encouragement to be found, however, in the study of maternal mortality, in the fact that for a considerable number of states there has been some decline in the past decade in the maternal mortality due to puerperal sepsis. Connecticut, New Hampshire, Vermont, and the District of Columbia have shown an increase.

It is particularly interesting to point out that this reduction of puerperal sepsis has been found also among the colored in Virginia, Maryland, North Carolina, and Kentucky with, however, an increase in the District of Columbia.

IS MATERNAL MORTALITY DECLINING?

We find that the maternal mortality, while showing a decline from 1917 to 1921, has practically remained constant for the past 4 years. Studied by special diseases, we find that there has been a percentage fall per year of 1.4 for puerperal albuminuria and convulsions for the past decade, and a percentage fall of 1.3 per year for puerperal sepsis.

There has been no decline in the past five or six years in maternal deaths from other causes and in one or two there seems to be an increase. Accidents of labor, which are definitely associated with obstetrical care, show a fall for the first 4 years of the decade but practically no fall since 1921. The same is true for accidents of pregnancy and all the other puerperal conditions with the exception of albuminuria and sepsis.

These facts again, when combined with the high mortality found in the first days of life, must direct attention to the question of obstetrical practice. Has there been an increase in the application of forceps, in the use of general anesthesia, in the administration of pituitrin, in general operative interference? May not these tendencies of modern life be the cause of our failure to obtain a reduction in the maternal mortality and in the neonatal mortality, and may not these practices offset the greater attention and care which is being given to the expectant mother or to the woman in the hospital?

PERCENTAGE OF SPECIFIED CONDITION IN TOTAL PUERPERAL MORTALITY

The facts are very clearly brought out when we see that contrasting 1926 with 1917 shows a reduction in puerperal sepsis, a very slight reduction in puerperal albuminuria and convulsions, and an actual increase in the accidents of pregnancy, the accidents of labor, and other puerperal conditions.

PUERPERAL MORTALITY IN URBAN AND RURAL AREAS OF NEW YORK STATE

The puerperal sepsis rate in the urban sections of New York State was more than twice as great as that in the rural sections and there was practically twice as high a mortality in all the other conditions in the urban area as in the rural.

A very interesting fact, too, is that when we consider the percentage fall per year in the death rate for this same period we find that in the urban area there was a percentage fall per year of 0.9 for puerperal sepsis with practically five times as great a fall for the rural area. For all other puerperal conditions the percentage fall has been very similar for urban and rural areas. These data are of particular importance because for purposes of this study the rural area included only communities with populations under 2,500.

PERCENTAGE BIRTHS DELIVERED IN HOSPITALS AND BY MIDWIVES

An attempt was made to study the relationship of hospitalization to maternal and early neonatal mortality. We find that in Minneapolis in 1914, 23 per cent, and in 1927, 78 per cent of the women were delivered in hospitals. This fact is generally looked upon as an evidence of real progress in the care of mothers and a practice that should lead to a marked reduction in maternal and neonatal mortality. However, there has been no reduction in the deaths in the first day of life throughout this period, there has been no reduction in deaths from puerperal sepsis, and there actually has been an increase in deaths from injury at birth. Some 12 cities were examined in regard to similar data and similar information has been obtained.

In Newark, N. J., a very similar situation is indicated. We have been able to include the percentage of women delivered by midwives, and we find that during the period the percentage of women delivered in hospitals has increased from 12 per cent to 50 per cent, and the percentage of women delivered by midwives has decreased from 50 per cent to 23 per cent. The deaths associated with puerperal sepsis have practically been constant. The deaths in the first day of life have shown a slight increase and the deaths associated with injury at birth, which, also, have shown a slight increase, present curves practically identical with those for Minneapolis.

We believe that it is very important to present these facts, so that they may stimulate further study and analysis. Some have intimated that the reason for not obtaining a reduction in puerperal sepsis in those cities which show a high percentage of hospitalization is that the better results obtained in the hospitals with full term deliveries are offset by the great increase in sepsis associated with criminal abortion. We believe that this should be thoroughly investigated to find out if it is an adequate explanation for the rather disappointing results. I think, however, that we are justified in saying that these facts must give pause to anyone offering general hospitalization as a solution to the maternal mortality problem.

NOTE: It will be recalled that at the Annual Meeting of the American Public Health Association in 1927, following a paper by Lee K. Frankel, Ph.D., on the Present Status of Maternal Mortality in the United States, a committee of the Child Hygiene Section of the Association was appointed to carry on studies on maternal and infant mortality. The paper abstracted here, largely in the words of its author, Julius Levy, M.D., chairman of the committee, is the first report of the above mentioned committee.

A more complete report accompanied by some of Dr. Levy's charts will be found in the *Transactions of the American Child Health Association for 1928*.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

The Passing of Miss Maxwell—Numbered among the pioneers of the nursing profession was Anna C. Maxwell. Her pioneer spirit was repeatedly manifested to her associates during a career of usefulness and interest. Miss Maxwell had characteristics which marked her as a unique and unusual personality. She was well known and well beloved.

In recognition of her services during the Spanish-American and World Wars, Miss Maxwell was given the honor of full military burial in Arlington National Cemetery on January 7.

Instruction on Ventilation—Over and over we have heard that sleeping with windows open is imperative. But we know that fresh air is needed all of the time. The new science of air hygiene now teaches a new technic in ventilation. The first requisite of fresh air is that it be of moderate temperature, so as to keep the surface of the body comfortably cool. [The author does not explain how this can be accomplished in summer.] The health temperature is 68° F. or a little below. The second requisite is gentle motion of the air without drafts. A moderate humidity is likewise essential.

In cool, moving air, the body feels comfortable and stimulated. Overheating prevents the most efficient functioning of mind and body. Colds occur more frequently in persons living in overheated apartments. The temperature should never rise above 68° F., except for old people and invalids.

Sleeping rooms should be much cooler than other rooms, but it is not necessary to maintain an outdoor temperature in bedrooms in winter by sleeping with all of the windows open. "If the sleeping room is unheated and the night is very cold, there will be, without much, if any, window opening, sufficient leakage of air around the windows to provide freshness, unless several persons are sleeping in the room." On the other hand, it may be possible to sleep in a room with the windows open and still not have a sufficient supply of air, because the bed may be so far from the window. Usually in climates where the temperature does not go below zero, some opening of the windows is necessary.

The proper place for emphasis in consideration of the new air hygiene is on coolness of air rather than on open windows, as such.—Thomas D. Wood, M.D., and Ethel M. Hendriksen, What the Clinic Should Teach about Ventilation, *Am. J. Nurs.*, 28, 9: 890 (Sept.), 1928. B. J. B.

The Newton Bill (H. R. 14070)—This bill makes provision for the continuance on a national scale of the work now carried on under the Sheppard-Towner Act (Terminates June, 1929). It provides for federal coöperation with states in reducing maternity and infancy death rates, and does *not* demand that state funds be appropriated to match federal funds.

An advisory committee to the chief of the U. S. Children's Bureau is created. Five non-governmental members may be appointed—experts in child welfare and child health—one a health officer appointed from the membership of the Conference of State and Provincial Health Officers.

An Uncompleted Gift—In memory of the nearly 300 American nurses who died during the World War, their compatriots in the same profession contributed $51,000 to house the Florence Nightingale School of Nursing at Bordeaux, France. It was planned to have a central building with two wings. The cost of construction increased so much, however, that it was necessary to omit the erection of one wing. It stands today incomplete. But it is not so to remain. The House of Delegates of the American Nurses' Association at the meeting in Louisville, Ky., in June, 1928, voted that $25,000 should be raised to build the necessary wing. The campaign for the funds, conducted through the state associations, began November 1, and will be officially terminated before the International Council of Nurses meeting in Montreal, Can., in July, 1929, when it is hoped that the amount can be given to a representative of the Bordeaux school.—Virginia McCormick, A Gift is to be Completed, *Am. J. Nurs.*, 28, 12: 1221 (Dec.), 1928.

Health Survey of New Haven, Conn.—The recent study of New Haven's health resources, accomplishments and needs, which was conducted by C.-E. A. Winslow, Dr.P.H., during the past year, is outstanding partly for its completeness and partly for the reason that it follows another study made 10 years ago by the same expert appraiser; and it has all the advantages of perspective and appreciation of obstacles overcome and progress made.

It is now revealed that more than three-fourths of the specific recommendations made in 1917 have already been carried out. A few of the remaining are no longer applicable under changed conditions, and others are under consideration. Such a record of accomplishment, together with the request for this second check-up of community needs before going on, indicates an unusually active and forward-looking attitude toward health which motivates the work of the different health groups in New Haven. The result is, in the opinion of Dr. Winslow, that New Haven promises soon to have the most perfect community health machinery in proportion to its size in the United States.

The survey covers all phases of the community health program, including dispensary and hospital service, visiting nurse service, tuberculosis, school and child welfare nursing, industrial hygiene, social hygiene, health education, sewage disposal, water and milk supply, housing, etc. In the special field of public health nursing, the study was made by Gertrude E. Hodgman, R.N., Yale School of Nursing, and Katharine Tucker, R.N., General Director of the Visiting Nurse Society of Philadelphia. Michael M. Davis, Ph.D., conducted the survey of hospitals and dispensaries. Recommendations for social hygiene were made by William F. Snow, M.D., General Director of the American Social Hygiene Association.

Dr. Winslow summarizes the general ideal toward which efforts in health work should be directed as

> . . . the development of the Health Department as the center for all directive and supervisory health functions; the Visiting Nurse Association as the center of all home nursing service (aside from such functions as communicable disease control); and the New Haven Dispensary as the center of outpatient clinic service (other than conferences for normal mothers and babies).

Specific steps to be taken to lead toward this goal are suggested.

1. The transfer from the Visiting Nurse Association to the Health Department of all responsibility for appointments of conference physicians.
2. The coördination of home service of the Visiting Nurse Association and the Health Department through the transfer of the duties of the present Board of Health Welfare Nurses to the nurses of the Visiting Nurse Association, just

as tuberculosis work has already been transferred. Provision of an annual grant from the Board of Health to the Visiting Nurse Association for maintenance of this work is recommended.

3. The development of venereal disease clinic service in conjunction with the New Haven Dispensary polyclinic service; appropriate financial contribution to be made by the Board of Health for that service.
4. The extension of the services of the Crippled Children's Aid Society so as to be available for patients of all orthopedic physicians.
5. Closer coöperation between the Visiting Nurse Association and the nurses of the Queen's Daughters, so that the latter may give more individual service to chronic and convalescent patients and the acutely ill may be transferred to the visiting nurses.
6. The development of a Council of Community Nursing under the leadership of the Visiting Nurse Association for the purpose of promoting sound growth in the future.

Certain additional expenditures of money are recommended to the Community Chest for the improvement of health facilities, among them being the development of a social service department in the New Haven Hospital and Dispensary, a mental health supervisor for the Visiting Nurse Association, additional nurses to meet increase in population, establishment of a cancer clinic, consideration of some provision for occupational therapy and facilities for the hospitalization of chronic and convalescent patients.

It is the opinion of the author that future developments in health work through the Health Department can be wisely carried out only with adequate financial provision, and a substantial increase in the appropriation for this department is recommended. The transfer of the Division of Vital Statistics to the Department of Health is urged, whereby detailed studies of morbidity conditions may be carried on. Expansion of the Health Department work should be made to provide more thorough school examinations, more comprehensive venereal disease educational and curative work, more popular health instruction and further assistance to relieve the Health Officer of routine inspections.

Haven Emerson, M.D., in a brief comment in the November 15 *Survey*, speaks of Dr. Winslow's survey as "New Haven's health examination" and describes it as the most complete, enlightening and constructive study that has yet been made for any city of its size.—C.-E. A. Winslow, Dr.P.H., *Health Survey of New Haven, 1928.*

K. E. P.

Intracranial Hemorrhage of the New-born—Throughout the length and breadth of the land, health workers are viewing with satisfaction the gradual and appreciable decline in the infant mortality rate during the first year. Dr. Benjamin P. Burpee's paper in the *American Journal of Nursing* forces upon the attention of public health nurses the fact that there is need for more and more watchfulness and keen observation on their part if the death rate among infants in the first month of life is to be lowered still further. To quote Dr. Burpee,

> The most fertile field for lowering the infant death rate under 1 year, at the present time, lies in the reduction of deaths that occur in the first week of life from the condition known as intracranial hemorrhage.

Intracranial hemorrhage is the cause of nearly half the deaths of babies under 2 weeks, and 100,000 babies under 1 month die each year in the United States. Hemorrhage within the cranial cavity is more readily recognized than it used to be, and better diagnosis reveals it as a more frequent complication than was formerly supposed. Early recognition and proper treatment play important rôles in curing the condition and preventing the sequelae.

According to Dr. Burpee, the public health nurse need not be either a practitioner or a diagnostician in order to

recognize the condition immediately so that it may be reported to the attending physician. Intracranial hemorrhage differs from hemorrhagic disease. In the latter, there is a definite increase in both the bleeding and coagulation times. Transfusion should be done both to aid the clotting and bleeding times of the infant's blood and to replace the blood that has been lost by external bleeding. In cases of intracranial hemorrhage only the coagulation increasing elements of the blood are needed. Hemorrhagic disease should be thought of as an entity and as one of the predisposing factors toward intracranial hemorrhage; the other two are asphyxia and trauma.

PREDISPOSING FACTORS WHICH PRODUCE HEMORRHAGE

Trauma—This is probably the greatest single factor; it is the actual laceration of some of the blood vessels within the cranium, resulting in the extravasation of blood somewhere within the brain substance, on the surface of the brain, or within the ventricles. The death rate from intracranial hemorrhage is higher in the first-born and higher in males which average a larger size.

Prematurity—When the blood vessels are not fully developed, they are more easily ruptured.

Syphilis—This is important only in so far as it tends to cause prematurity.

Maternal Toxemia—This tends to make the fetal blood vessels more easily ruptured.

Asphyxia or Congestion and lastly *Hemorrhagic Disease* of the new-born.

ETIOLOGY

Too little is known about the etiology of intracranial hemorrhage, but it is not always due to poor obstetrics since many cases occur in easy, normal, spontaneous deliveries. Trauma is the chief cause although it is often beyond the control of the physician. The use of forceps properly applied does little damage. It is questionable whether pituitrin can cause the hemorrhages by causing too rapid passage of the head through the cervix. It is also logical to suppose that a toxin circulating in the blood of the mother may make the fetal blood vessels more friable.

Some authorities contend that cases of intracranial hemorrhage are infectious and indeed have rather convincing evidence to substantiate their arguments. It is believed that anesthesia plays an unimportant rôle, if any, in the causation of the disease. Obstetricians agree that it is unwise to deliver the fetal head and leave the body in utero since the difference in the two pressures causes an asphyxia and thus may tend to produce hemorrhage. Breech presentation occasionally causes hemorrhage and in combination with prematurity is particularly dangerous. Precipitate labor figures largely because of the rapidity with which the fetal head is pushed through a not completely dilated cervix.

SYMPTOMATOLOGY

Every nurse should familiarize herself with the symptoms of intracranial hemorrhage. The symptoms are not always the same, but there are certain ones which are readily recognizable.

1. *Cessation of normal nursing*—This is the most important single symptom. A new-born infant who is nursing well for the first two or three days and then cannot be made to nurse should be subjected to careful medical inspection.

2. *General attitude of child*—It may be either very restless and crying all the time with a shrill cry suggestive of meningitis if the hemorrhage is on the hemispheres, or it may be very limp and not cry or open its eyes if the hemorrhage is below the tentorium.

3. *Color*—The infant may be pale or cyanotic, again according to the location of the hemorrhage.

4. *Pulse*—The pulse may be either

rapid or slow, from exhaustion or irritation of the vagus nucleus.

5. *Temperature*—This frequently varies from between 103° and 104° to normal or subnormal. Probably the high temperature denotes dehydration.

6. *Respiration*—Difficulty with respiration is a frequent symptom and may even be fatal due to pressure on the respiratory center.

7. *"Continual complaint" or restlessness.*

8. *Cerebral irritation*—This is manifested by twitching of the hands and feet, dysphagia and even convulsions.

9. *Paralysis*—Usually this is a last symptom.

Vomiting and hemorrhages in other parts of the body are other symptoms.

TREATMENT

This consists of two procedures; 20 c.c. of whole blood should be given intramuscularly in varying doses until the symptoms subside. This is a perfectly safe and simple procedure.

Lumbar puncture is performed for the purpose of relieving the pressure within the head. It is the pressure, resulting from the hemorrhage, which causes death. The puncture should be performed every 8, 12, or 24 hours.

SEQUELAE

If the hemorrhage is severe, death takes place rapidly. If the infant survives without having had proper treatment, Little's disease, spastic paralysis, idiocy or feeblemindedness may result in later years, as well as certain types of epilepsy. The early recognition of cases cannot be stressed too greatly.—Benjamin P. Burpee, M.D., Intracranial Hemorrhage of the New-born, *Am. J. Nurs.*, 28, 12: 1183 (Dec.), 1928.

Correspondence Course in Public Health Nursing—A correspondence course in public health nursing given by the University and Bellevue Hospital Medical College, New York, N. Y., in coöperation with the New York State Department of Health is enrolling students for the 1929–1930 courses. The course consists of 25 lessons of 10 hours each, and a residence week of study at one of the large medical centers of New York State is required as a part of the course. The first lessons of the course will be ready for distribution to matriculated students March 1.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Health Appeal in Advertising—The battle royal now on between the competing anti-fat advertisers accentuates the whole problem of health education in various forms by commercial firms. December 8, 1928, the *Journal of the A. M. A.* reviewed the situation as to space advertising. The use of posters and other educational printed matter supplied from commercial sources calls for thoughtful, searching discussion in public health journals and conventions.

One-in-two at Chicago—Devoting the two main sessions of the Public Health Education Section to one theme was quite a success. The new subject of program planning was fortunately presented by a group of speakers with a high batting average. Doubtless de-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

tailed reports will appear in the *Journal*. The group of program outlines distributed in mimeographed form will be supplied for 6 cents postage, while the limited supply lasts. Address the editor. The complete file of year-round programs submitted in advance to the chairman of the two meetings, Mrs. Routzahn, will be loaned for payment of express charges both ways. They weigh 6 pounds. Address the editor.

When the Devil Tempts the Writer—

Commenting on Bunyan's *Pilgrim's Progress*, his biographer states, "The style of the book is plain, such as the lowliest readers—even the farmers that spell out the words—can understand." Bunyan himself says concerning this book, "I could also have stepped into a style much higher than this in which I have here discoursed, and could have adorned all things more than here I have seemed to do; but I dare not. God did not play in convincing of me; the Devil did not play in tempting of me; wherefore I may not play in my relating of them, but be plain and simple, and lay down the thing as it was. He that liketh it, let him receive it; and he that does not, let him produce a better."

The celebration of the 300th anniversary of the birth of Bunyan this year and the fact that his *Pilgrim's Progress* is said to be the most popular book in the English language with the exception of the Bible, gives this advice special significance. Personally, I love his recipe for writing. Now for the first time I know that whenever I put an especially elaborate literary flourish into a manuscript, it is the Devil that has tempted me.

—Louise Franklin Bache, National Probation Assn.

Health in 1929 Commencements—

The emphasis on health as the special theme of the 1929 commencements should (a) lead each graduate to adopt a high standard of fitness for himself and to understand how to maintain that standard in terms of personal habits and medical and dental care; (b) include a special study by each graduating class of the time lost in its own school as a result of ill health, the findings to be presented as a part of a commencement program; (c) include special study of the lives of such great torchbearers for health as Pasteur, Walter Reed, and William Osler; (d) include awards of school letters to graduates who have maintained high standards of health and school coöperation; (e) include special consideration by classes in professional colleges of education, medicine, law, and engineering of the part each profession can take in the improvement of public health.—

A Movement to Vitalize Commencements, *Journal of National Education Assn.*, Washington, Dec., 1928.

In the January issue the *Journal* urges again that health and safety be emphasized in 1929 commencements, and offers specific suggestions for elementary schools, junior high schools, senior high schools, colleges and professional schools. In colleges "orations and essays may be built around the lives of pioneers who have made significant contributions to medicine or public health. These may be descriptions of recent great discoveries such as insulin." In professional schools "let law students show how health may be advanced through better legislation," and so on. 25 cents for copy, 50 cents for both issues.

Doubts from the Outside—

In the absence of any definite proof of the nature of influenza, the present rush to close schools is of doubtful value. Children may easily find in the hours away from school exposures and risks that are quite as serious as those of the classroom. For millions of city people the common injunction to stay away from crowds is ludicrous in its impossibility of fulfilment. We live, move, and snuffle in crowds whether we will or not—and in the subways of New York we breathe in our neighbors' faces with undisturbed serenity because there is no other place to breathe.

—*The Nation*, Jan. 2, 1929.

Two Opportunities not to be Missed—The Early Diagnosis Campaign of the tuberculosis associations in March, and National Negro Health Week, March 31 to April 7, 1929, both offer possibilities for all health agencies and coöperating groups—not to help out the sponsoring organizations, but to utilize the opportunities presented. Ad-

dress any tuberculosis association and National Negro Health Week, Tuskegee Institute, Ala. At a conference of Negro Health Week leaders " it seemed to be the consensus of opinion that one of the greatest needs is an adequate supply of well trained public health nurses."

" Enter Your Tb Publicity Relics " —This is the plea of Dr. H. E. Kleinschmidt, as a committee of the National Tuberculosis Association. The specimens from a " dim, dark past " of tuberculosis publicity and education will be exhibited at the National Tuberculosis Association's 25th anniversary meeting at Atlantic City, N. J., in May.

Have We Listed the Leading Citizens?—Mrs. Mary Breckinridge, director of the Frontier Nursing Service in Kentucky, is reported as saying:

> The leading citizens of any community comprise approximately 10 per cent of its population. If the nurse seeks these out, uses them in committees and gets them educated as to what she is trying to do, she can accomplish anything.

Who are the " leading citizens "? The key individuals? The key organizations in the city or county? Have we made a plan, covering a year or several years, to inform them and to enlist them?

CONTESTS

In the April 1, 1929, poster contest conducted by the Massachusetts S. P. C. A. medals with blue ribbons are offered for first prizes, and medals with red ribbons for second prizes, with honorable mention for every school entering the contest. A good idea for health poster contests?

The Massachusetts contest covers drawings by pencil, or crayon, pen and ink, cut-out paper (original, not magazine covers, etc.), or silhouette, water color or charcoal. The use of colors is strongly recommended. For full conditions as a sample write the society, at 180 Longwood Ave., Boston, Mass.

A New York city worker asks about essay or limerick contests. Please send details of your contests, or mention who have held such contests.

If you have made use of soap sculpture, you will wish to get details of the fifth annual competition for prizes—closing May 1. Address: National Small Soap Sculpture Committee, 80 East 11th St., New York, N. Y.

Another simplified description of " Cutting and Printing Linoleum Blocks " is in *Scouting*, 2 Park Ave., New York, N. Y., Nov., 1928. 10 cents. Linoleum blocks offer possibilities for a new line of illustration for printed matter, and as a contest among children or adults.

The aftermath of the New York State Diphtheria Poster Contest is notable for the well developed plans for getting the most out of what might have been merely a contest in poster designing, with awards and a public display of the winning posters. Now that the first prize poster has been reproduced as a 24-sheet billboard poster the use planning continues. The winning artist will unveil one of the posters on LaFayette Square, in the center of downtown Buffalo. In many cities the schools will participate in the local " unveiling." Mrs. Marie F. Kirwan, S. C. A. A., 105 East 22d St., New York, N. Y., will send copies of mimeographed bulletins regarding the uses made of the poster contest. (One reader of this copy raises a question: Is the unveiling idea over-emphasis? What do you say?)

EXHIBITS

A blue ribbon was awarded the State Fair exhibit of the Tennessee State Dept. of Health. Entitled the " Journey through Life," " the periods of life —prenatal, maternal, infancy, preschool, school, adolescence, adult and old age

—were depicted by cardboard cut-out illustrations which showed both the correct and incorrect methods of living."

For those who visit New York City: the American Museum of Safety is at 120 East 28th Street, east of 4th Avenue. Leave any subway at 28th Street and go to the east.

How portable window exhibits were made by the staff of Bellevue-Yorkville Health Demonstration, New York, N. Y., and how drug-stores were led to give window space, is told in "Selling Health in Drug-stores," by Marjorie D. Candee, *Survey*, Jan. 15, 1929.

Many of the gay holiday wrapping papers (including those sold in five and ten cent stores) will give life to dull health posters and placards. Mount the poster so that several inches of the wrapper show on the top and both sides —and an inch or two more at the bottom.

The Smithsonian Institute, Washington, D. C., has issued a booklet descriptive of its permanent exhibit of visual lessons in health and hygiene and "those matters concerning personal and community cleanliness which should be known everywhere." 25 cents.

When you wish to construct a miniature bathroom as an exhibit, ask Jane Hufford, Chicago Tuberculosis Institute, 360 North Michigan Blvd., Chicago, Ill., for a copy of typewritten description. Miss Hufford reports that Marshall Field and Co., Chicago, sell for 95 cents a set of white enameled metal bathroom furniture. Bedroom furniture sells for $1.95—in white or mahogany.

MEETINGS

Five regional meetings of public health nurses in Indiana "were very successful." The groups were so small and informal that everyone felt free to bring up her problems and express her ideas.

How about trying on your service or luncheon clubs the idea of once a year calling for a "grand jury" report on the health problems of club members—the "jury" being appointed by a club a month or two in advance of the luncheon where the report will be presented? A new approach for getting group consideration of personal or community health needs?

IS PUBLICITY NEEDED?

The hygiene teacher in a mid-western college took her class to the headquarters of the local Visiting Nurse Association. Afterwards, one of the young men said, "I'm so glad we made that visit. I'd often seen those visiting nurses on the street, but I always thought they were nuns."

Any further examples to go under this heading?

WORDS

"A bath every day keeps you fit in every way."—In house organ of a state department of health. (Can this be true? Will their readers believe it to be true? If not, then what?)

RADIO

In the Public Health Section of the British Medical Assn. Dr. W. W. Jameson strongly commended "frequent four-minute broadcasts on matters of special health interest" as being more effective than longer talks at monthly intervals.—*The Lancet*, Aug. 18, 1928.

Recently, the Union des Grandes Associations Francaises pour l'Essor National (Union of French Associations for National Development) organized a special wireless health propaganda week. . . . Eminent French specialists spoke on school hygiene, housing, the venereal diseases, the anti-tuberculosis campaign, mental hygiene, health and education, the campaign against cancer, social insurance, women and public health, child welfare, and the anti-alcohol campaign.—*The World's Health*.

Feb., 1928. How like a "health week" program west of the Atlantic!—most everything, but not much of anything.

Two radio talks on cancer appeared in the July, 1928, issue of *Campaign Notes,* Am. Soc. for the Control of Cancer, 25 West 43d St., New York, N. Y.

Ten stations are now broadcasting a series of talks supervised by the Canadian Social Hygiene Council. Talks on child hygiene, smallpox, diphtheria, etc., are included in the series.

REPORTS

"One of the weak points in the popular health education progress of the city is the lack of standardized annual reports for the various public health agencies which will permit a central agency, such as the Federation or the Health Department, to compile the facts concerning the activities of the agencies, so as to present a composite picture of all activities in a particular field. The bringing together of information for public presentation of the needs in any field and the facilities available for meeting these needs is essential if continued and adequate public support is to be obtained."—*An Appraisal of Public Health Activities in Cincinnati, Ohio, for the Year 1926,* by the Committee on Administrative Practice of the American Public Health Association, p. 99.

A well organized account of widely diversified activities scattered over the whole country is presented in *The Story of May Day: 1924–1928,* by Katherine Glover. 108 pages. American Child Health Assn., 370 Seventh Ave., New York, N. Y. The half tones are grouped on 8 pages of good dull finish paper in the center of the book. Curiously enough there is no publication date. We think there should have been a table of contents or index, or both.

PEOPLE TO KNOW

George A. Dundon is now director of health education, Health Department, Milwaukee, Wis.

Thomas A. Burke has succeeded Arnold A. Mowbray as director of public relations, National Safety Council.

Mary Ross, who handles health topics in *The Survey,* and Bernard C. Roloff, Chicago Department of Health, are members of the Executive Committee of Educational Publicity Division of the National Conference of Social Work. Evart G. Routzahn was elected chairman for 1928–1929.

BOOKS AND REPORTS

Annals of the Pickett-Thompson Research Laboratory (*Vol. IV, Pt. 1*) —*London: Baillière, Tindall & Cox. Baltimore: Williams & Wilkins, Nov., 1928.* 250 pp. Price, $10.00.

The first of the volumes devoted to the streptococci was reviewed in this *Journal* in June, 1928, page 829. The present volume begins the study of the pathogenic streptococci and is given practically entirely to the rôle which these organisms play in rheumatic fever and its complications. Chorea is definitely declared to be a manifestation of cerebral rheumatism, a theory which has been held by some for many years, but has not been definitely accepted. The authors do not venture an opinion as to the etiology of erythema nodosum, though they give evidence indicating that it may be caused by streptococci, point out its apparent contagiousness and its relation to rheumatism, tonsillitis and endocarditis. Approximately 110 pages are given to the study of rheumatic carditis, including some 14 pages on treatment by streptococcal vaccines and sera.

With the exception of the section on erythema nodosum, the authors sum up the literature and give their conclusions. They hold that rheumatic fever is a definite specific disease exhibiting such constant and typical lesions as to make it highly probable that it is caused by a definite specific organism. It is generally preceded or accompanied by sore throat, so that it is probable that the specific organisms enter the system through the tonsils, in which they may remain for a longer or shorter time, causing systemic effects by the absorption of their toxins. They consider it much more probable that the germ enters the system. There is equally good evidence that the streptococci play an extremely important part in the production of rheumatic fever and carditis, but the differentiation of the varieties has been faulty and great confusion has resulted.

The authors continue to follow the methods devised by Dr. Crowe, and hold that the differential medium with the photographs of cultures introduced by him " will constitute a new stimulus and initiate a new era in bacteriological research." This opinion is again expressed in spite of some criticisms of the method after the appearance of Volume III.

The present work, like Volume III, shows an enormous amount of careful study of the literature and collation of facts. The microphotographs are excellent.

Volume IV will be completed by four further monographs, and will be followed by two more volumes on the pathogenic streptococci. In view of the excellence of the two volumes so far issued, we must look forward with much interest to those promised, and it may be again predicted that the entire series will be the most complete and authentic study of the streptococci which has been made. The volumes will be indispensable to every bacteriologist.

M. P. RAVENEL

Protecting the Semi-public Water Supplies along Pennsylvania's Highways—*Pamphlet of Pennsylvania State Health Dept.* 50 pp.

During the early spring and summer an intensive drive was made on semi-public water supplies along Pennsylvania highways. Thirty-two hundred miles of roads were covered and 3,130 drinking water supplies investigated.

Two mobile laboratories and the main state laboratory were used. Nine engineers, 3 laboratory assistants and 3 technicians composed the personnel.

Forty-five pages of the pamphlet are devoted to a detailed record of all supplies examined. It is to be noted that less than 50 per cent of the supplies examined on the first trip around were approved. ARTHUR P. MILLER

Handbook of the Health Exhibits of the United States National Museum—*By Charles Whitebread. Washington, D. C.: Smithsonian Institute, 1928.* 39 pp. Price, $.25.

In 1922 a Hall of Health was established in the Arts and Industries Building of the United States National Museum. This national health and hygiene exhibit has been growing gradually and is now fairly extensive, though not as yet commensurate with its original plan. The exhibit is ably described in this well printed and attractively illustrated pamphlet, which should be of value to all who are interested in public health education. JAMES A. TOBEY

A Doctor Looks at Marriage and Medicine—*By Joseph Collins, M.D. Garden City: Doubleday, Doran, 1928.* 313 pp. Price, $3.00.

Physicians have their own way of looking at things. Unless it be lawyers, none more than physicians have occasion to look into the complicated question of marriage. This title, in passing, is somewhat misleading. It might better have been "A Physician Looks at Marriage and Medicine," because there are many other kinds of doctors—divinity, philosophy, and whatnot.

After reading this book one must resume the attitude of expectancy. We still await *the* book by a physician on marriage as excellent in its presentation as the subject is important.

In the midst of a lot of words there are some arresting thoughts which occur at just sufficiently frequent intervals to keep one reading on. It is not very concise; it is none too clear; and better perhaps for neurologists to wade through, for the mental legs of ordinary readers are too short and not built for quick turns.

Some of the schemes advanced are novel, to say the least. For instance, on page 47 it is advocated that an intelligent woman, whom eugenists would class as a good breeder, should approach one of the opposite kind with the proposal that she will raise so many more children if the poor stock person will agree to breed so many less. Does the author advocate that plan seriously, or with his tongue in his cheek, or like a boy with a stone who throws it through a window to hear the glass crash?

The author assumes an attitude something like this: Now I shall stand apart as a neutral and discuss a very perplexing question. But, he does not maintain that attitude, for his neutrality is constantly interrupted by personal opinions which he occasionally seeks to bolster up with statistics. Where statistics are not available, or not sufficiently forceful, guesses are substituted in their place. W. W. PETER

The Principles and Practice of the Dilution Method of Sewage Disposal—*By W. E. Adeney. New York: Macmillan, 1928.* 161 pp. Price, $5.00.

Considering the fact that over three-quarters of the population of the United States disposes of its sewage by dilution in water courses, it is surprising that the dilution method of disposal has not been the subject of a fairly comprehensive text. This lack the present volume supplies in a very satisfactory and helpful manner. Once more, but in this instance in more detailed fashion, the general principle is emphasized that discharge of sewage into a stream, in con-

trolled amounts, offers a true method of disposal, comparable in status with, and more widespread in application than any other method of disposal now available. The indiscriminate prohibition of discharge of raw or settled sewage into streams, at present the gospel of some misguided sportsmen, is as unintelligent a program of action as a policy of unrestricted discharge would be. Dr. Adeney sets forth in unusually instructive fashion the general principles underlying the dilution method of disposal and the analytical indices of purification helpful in the application of these principles. He supplies a reference book of much importance to those concerned with the significant problems of sewage disposal. Lay and professional readers will be impressed with the interesting and logical evolution of the subject matter, from both the historical and scientific viewpoints.

The author is peculiarly fitted for the present task by virtue of his own original contributions to research in sewage disposal and his affiliation with the investigations of the Royal Commission on Sewage Disposal of England, the Metropolitan Sewerage Commission of New York, the Sanitary District of Chicago, and of similar agencies elsewhere. His theme is that any given river has a measurable capacity, through the agencies naturally existing in it, for the work of disposing of and purifying the raw or settled sewage of a community, at the same time protecting properly the amenities of the river and its fish and vegetable life. The recognition of this principle is of vast economic and sanitary importance.

In the development of the theme, the author points out the fundamental fallacy, originally given authoritative emphasis by the erroneous conclusions of the Rivers Pollution Commission of 1868, that the changes in a sewage polluted river were purely chemical rather than biochemical in nature. Finding no traces in their studies of streams of characteristic end-products of complete oxidation, the commission's recommendations resulted in the unscientific and unsuccessful prohibitive legislation, the Rivers Pollution Prevention Act of 1876. In intent and in theory, the Act returned streams to their pristine purity; in fact, it did little more than retard progress in stream pollution investigation and regimentation.

Adeney reviews the progress from that time on and provides a remarkably clear analysis of the historical and scientific data now available in this field. Chapters are devoted to characteristics of bacteria and higher forms of stream life, the course of fermentative changes of sewage matter, the formation and effects of "humus," the mechanism of purification of sewage liquor by the dilution method, the rates of consumption of dissolved oxygen by sewage and the rate and mechanism of surface aeration. A chapter is devoted to a careful comparison of the standards earlier recommended by the Royal Commission with the area and depths of streams.

It is gratifying to note the author's emphasis, in Chapter 8, upon the injurious effects of sewage solids in rivers and streams, an emphasis entirely concordant with the experience and policy of most American engineers.

The book concludes with several chapters on methods of analysis, special apparatus, and collection of samples. The bibliography is excellent, the table of contents most complete and instructive, and the paper, typography and arrangement attest the usual high standard of the productions of the Cambridge University Press.

The reviewer cannot resist the temptation to inquire, at no risk of reflecting upon the excellence of the present text, why the author refers so briefly and, we may presume, inadequately to the excellent contributions on the mechanism of stream purification issued

by the Cincinnati Stream Studies Station of the U. S. Public Health Service. Their findings would add even further to the already great value of the text.

ABEL WOLMAN

Fundamental Gymnastics—*By Niels Bukh. Translated, rearranged and adapted for use in America by Emily Russell Andrews and Karen Vesterdal. New York: Dutton, 1928.* 202 pp. Price, $2.00.

This book attempts to set forth the theories and practices in gymnastics of Niels Bukh, whose work in Denmark has considerable vogue, and which has been much advertised and exploited by a certain group in the United States.

Originally it was designed by Bukh to correct maladjustments and faulty occupational habits of posture. In this country, those who have been most interested are largely specialists in the corrective and remedial field of gymnastics.

These gymnastics are designed to remedy stiffness, lack of power, and awkwardness or lack of coördination. The objectives, as set forth in the text, are flexibility, strength, and coördination or agility. The translators claim that the exercises were not designed as a system, and that they are made up of non-definite movements. These aim also to "increased and unlimited range of movement." They are somewhat self-testing.

The book, in addition to general statements and exercises, presents definite chapters on exercises for flexibility, strength, coördination, combined exercises, and self-testing exercises.

The exercises described are largely of the corrective-gymnastic type, frequently reënforced by the individual grasping his own legs or ankles to secure greater flection at the hip and back. Many of them are forced and strained and frequently made more so by the pulling or pushing of a second individual. They tend particularly to pull and stretch the structures of the lower back.

These are formal exercises—many of them of great power—which would be corrective in the hands of an expert, but dangerous in the hands of a person who did not have an intimate knowledge of the anatomical structures concerned, and also an intimate knowledge of kinesiology. These are not exercises to be used by the product of some six weeks' summer course. For the person interested and trained in the corrective gymnastics, this book presents many valuable exercises.

C. H. KEENE

Wheat Flour and Diet—*By C. O. Swanson, Ph.D. New York: Macmillan, 1928.* 203 pp. Price, $2.50.

Although some food faddists and similar fanatics have attempted to decry the plentiful use of bread in the diet, usually for absurd and fantastic reasons, the "staff of life" properly continues to be one of our most important and valuable foodstuffs. By no means is it a complete food, but all competent authorities agree that at least one-quarter of the daily diet may consist of cereal foods, including white bread. Professor Swanson recognizes the limitations as well as the value of wheat and does not hesitate to set forth the former and to recommend that bread be supplemented in the diet with such all-round foods as milk and leafy green vegetables. Most modern bread is, for that matter, made with milk. This book is not propaganda for wheat, but is an impartial and accurate account of the kinds of wheat, their preparation and methods of milling, the food constituents of wheat, and its proper place in the diet. The chapters on nutrition are correct and the whole book will be of value to sanitarians, home economics workers, and others who desire succinct information on this subject. The book should also be of value and interest to the general lay public.

JAMES A. TOBEY

The Genesis of Epidemics and the Natural History of Disease. *An introduction to the science of epidemiology based upon the study of malaria, influenza and plague—By Clifford Allchin Gill, Lt. Col., Indian Medical Service. New York: William Wood.* 550 pp., 19 charts, 10 maps, 1 diagram. 1928. Price, $7.50.

The author's primary and basic thesis is that epidemics of all diseases and all types of epidemics are dependent upon an identical mechanism. The genesis of epidemics is in all probability the outcome of a unitary mechanism. The nature of this mechanism is explained by the quantum theory which postulates that all epidemical phenomena are essentially dependent upon a change in the relationship of the infection quantum and the immunity quantum. It ascribes the precise cause of "loss of equilibrium" between "infection" and "immunity," primarily and predominantly, to an increase of the infection quantum; in other words, it postulates that the essential factor in the causation of epidemics is of a quantitative rather than a qualitative nature. The theory also regards the circumstances associated with oscillation of the infection quantum as likewise conducive to correlated oscillations of the immunity quantum.

An epidemic is thus regarded as mainly the outcome of a quantitative change of the transmission factor and the immunity factor, and the intensity of epidemics is held to be a function of the range of amplitude of these factors, which, in turn, is attributed to the influence of climatic conditions in determining a great and sudden elevation of the infection quantum and a corresponding depression of the immunity quantum.

Other subsidiary factors are concerned in the operation of the quantum theory; thus climatic conditions responsible for the oscillations of the infection quantum and of the immunity quantum may occasion correlated changes of the human factor and of the parasite factor also, which add to the disturbances in the equilibrium between infection and immunity.

It might appear that this admission by the author would allow for changes in virulence in the parasite which he elsewhere seeks to set aside as quantitative rather than qualitative. He regards the occurrence of qualitative changes in specific parasites in the direction of exalted virulence as not entirely free from doubt. Attenuation is not discussed in this connection.

Prolificity, induced by favorable climatic or other conditions, in his opinion affords a quantitative aspect of the toxicity of epidemics, which may be substituted for the qualitative change in the *materies morbi*. It may be held that the difference of toxicity exhibited by pneumonic and bubonic plague is indicative of the variable virulence of the plague bacillus, but it may with equal cogency be argued that the facts are capable of an alternative explanation. It is, in fact, possible that an aerial route of transmission has placed the organism in an environment highly favorable to its prolificity—in other words, to its multiplication—and that the extreme toxicity of pneumonic plague, as compared with bubonic plague, is indicative of an extremely high infection quantum. The relative toxicity of the pulmonary form of anthrax (wool-sorter's disease) and malignant pustule, and of pulmonary tuberculosis, as compared with lupus, may be susceptible of a similar explanation; it is possible therefore that a change of toxicity, in association with a change in the route of transmission, is indicative of a change in the quantum of infection.

In the light of these considerations it

is held that the enhanced toxicity exhibited by epidemics is capable of explanation in terms of a change in the quantum of infection, and that, since the facts appear to be capable of explanation upon this basis, it is unnecessary to assume that the specific parasite undergoes any change of virulence prior to the occurrence of epidemics.

The author has applied his quantum theory to the epidemics of malaria, plague, and influenza in recent years in the Punjab and in every case finds that the data are in conformity with his quantum theory. One of the striking features of the epidemic diseases of India is their higher intensities, measured in the case of a lethal disease, by the death rate per 1,000 of the population, in the subtropical as compared with the tropical parts of that country. Malaria in subtropical India may reach a mortality twenty times above normal. Plague mortality in 1898–1918 was 122.2 in the Punjab, 3.4 in Madras, and 1.4 in Bengal. In the pandemic of influenza of 1918–1919 the death rate in the plains of the Punjab was 58, and only 8.5 per 1,000 in Bengal. It is therefore clear that each of these three great epidemic diseases—two of which are insect borne and one air borne—exhibit precisely similar features in respect of their high intensity in the north and their low intensity in the strictly tropical parts of India. The available data in connection with epidemics of relapsing fever and smallpox (before the introduction of vaccination) are also consistent with the view that these diseases also exhibit relatively high intensity in the north of India, and it is therefore justifiable to conclude that "intensity" constitutes one of the generic features of epidemics, and that it should, in consequence, be explicable in terms of the quantum theory.

The more equable conditions in the tropical parts of the country prevent marked disturbances in the equilibrium between infection and immunity, while the sharp climatic contrasts in the Punjab afford opportunities of great disturbances and thus for epidemics of maximum intensity. The high death rate in the Punjab is the outcome of the influence of climatic conditions upon the unitary infection-immunity mechanism.

"What is it moulds the life of man?
The Weather!"
What is it swings the scythe of Death?
The Weather!

Biologists, not statisticians, are not as yet convinced, however, that genetic differences in host and parasite can be thus dismissed as factors in epidemics. The recent evidence of the experimental induction by Muller and by Patterson of similar changes in germ cells and soma by radiant energy tends to support the view that biological changes in both host and parasite, as well as the weather, may be concerned in the problems of epidemiology. C. A. KOFOID

An Introduction to Practical Bacteriology—*By T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc. (2d ed.) New York: William Wood, 1928.* 390 pp. Price, $3.50.

During the 3 years which have elapsed since the appearance of the first edition of this excellent practical guide, bacteriology has made considerable advances. The authors have taken advantage of the necessity for a new edition, not only to bring the material up to date, but also to supply some deficiencies noted in the first edition. The size of the book has been increased by approximately 100 pages. The most notable additions are an increase in the material devoted to immunological methods and brief details concerning the most important pathogenic organisms of domestic animals. Many of these produce disease in man, and others, the streptococci for example, are

identical in appearance in man and animals, and the bacteriologist must know all types in order to conduct his work properly.

The authors speak rather positively about the Dick reaction, and do not give the Dochez method of producing antitoxin. They do not mention either the vaccine or serum against anthrax. General methods for the preparation of bacterial vaccines are given, but these do not apply to anthrax vaccine.

On the whole, we consider the work among the best of its type, and can heartily recommend it to teachers and students alike. The printing and binding are good. The price seems excessive for a book of its size.

M. P. RAVENEL

The Community Use of Schools—*By Eleanor Touroff Glueck. Baltimore: Williams & Wilkins, 1927.* 222 pp. Price, $3.00.

In an interesting and well written volume Dr. Glueck presents the results of her study of the extra-curricular use of school buildings in the United States. Her personal contact with the school center movement in Boston covering a number of years makes her discussion of the problems involved in this movement especially significant. She has in this study attempted to secure, for the first time, with the assistance of the U. S. Bureau of Education, information regarding the school center movement in rural sections of the country.

Dr. Glueck, for the purpose of this study, has defined a social center as the use of a school building once a week for two types of activity, or twice a week for one type not including night schools. She reports a more general use of school buildings for community purposes in rural districts than in cities. While but 5½ per cent are being used regularly for community purposes, the school houses in the United States are quite generally open for occasional community purposes. The administration of school centers is usually under the board of education, but 10 per cent of centers are under the control of private groups, though 21 per cent are entirely self supporting.

A valuable part of the book is a compilation of the school laws of the various states which have to do with the use of school buildings for community purposes. In a chapter tracing the development of interest in the use of school buildings for outside activities, Dr. Glueck points out the various factors which have influenced state legislation on this subject. The states are shown to vary in regard to this aspect of schools fully as much as they do in regard to other phases of education. Oregon has a state law prohibiting dancing in public schools. Some states prohibit religious meetings, others permit them. Dr. Glueck feels that interchange of experience among those interested in the movement is one of the greatest needs of the present day. Creative leadership such as the movement in Wisconsin has had, would go far to assist in solving some of the problems in connection with the administration and conduct of school centers.

JOSEPHINE BROWN

A Manual of Water Supply, Sewerage and Sewage Treatment for Public Buildings in Ohio, *for Engineers, Architects, etc. Div. of San. Engineering, State Department of Health, Columbus, O., 1928.* 13 pp. and charts.

This excellent bulletin defines for designers the requirements of the state health department with respect to water supply and sewage treatment devices for such buildings as are not situated so as to have access to public water and sewerage systems.

Applicable sections of Ohio laws are quoted, and suitable cuts of wells and sewage treatment appliances are shown.

It is pointed out, however, that the cuts are not intended to be working drawings but to illustrate essential details.

Architects and engineers engaged in designing public schools and other buildings in Ohio should welcome this publication, as it leaves no doubt nor makes no mystery of what is desired. Consistent use of it should tend to improve and standardize sanitary installations in that state. ARTHUR P. MILLER

Progress Report on Cannery Waste Treatment Studies. *State Department of Health of Ohio, 1928.* 85 pp.

This bulletin presents in a concise form the results of researches on the treatment of cannery wastes.

During the fall of 1926, at Canal Winchester, O., the Ohio Canners Association fostered studies of the treatment of raw wastes from packing plants for corn, succotash and lima beans by means of fine mesh mechanical screens, chemical precipitation, and chlorine sterilization, and of the oxidizing of these wastes screened on coarse filters of laths and of crushed limestone as well as on two sand filters.

During 1927, the Association of New York State Canners, Inc., continued these studies at Albion, N. Y., by investigating principally the oxidation of wastes from green bean and tomato packing plants. Some data on dried bean canning and pea wastes were also procured.

Both studies are admirably summarized at the beginning of the bulletin, making it unnecessary to read the entire mass of data unless a detailed study of it is essential.

The conclusions can probably not be stated better than in the summary where they are given as follows:

1. Mechanically operated fine screens with openings of about 0.010 inch are most essential features of treatment plants. Where oxidizing processes are employed for tomato products waste, following screening a relatively short period of sedimentation is necessary.

2. The organic matters in finely screened corn, lima bean, succotash and green bean wastes are removed with sufficient thoroughness to correspond to the requirements of extremely limited dilution, by coarse grained trickling filters operated at rates of 2,000,000 gals. per acre per day and 250,000 gals. per acre-ft.

3. Coarse grained trickling filters operated at the above rates cause a substantial reduction in the organic matters dissolved in finely screened and settled tomato products waste, but under the test conditions the effluent is not stable, requiring at least a four-fold dilution with normal stream water.

4. Chemical precipitants under controlled application and with effective arrangements for the complete separation of the resulting floc, remove to a most substantial degree the dissolved organic matters in finely screened tomato products waste. The settled effluent is completely stable.

5. Where waste treatment is required, the complete separation of cooling water from the wastes proper is essential.

6. Silage or stack juices should ordinarily be removed by cartage. Similar disposition may often advantageously be made of blancher wastes from pea and dried bean processing. Core-skin puree should be hauled away if produced, or preferably tomato residues incident to chili sauce production should be conveyed to carts uncycloned.

ARTHUR P. MILLER

Lehrbuch der Hygiene für Studierende, Arzte und Gesundheitsbehörden—*By Dr. med. et phil. Ernst Gerhard Dresel. Berlin: Urban & Schwarzenberg, 1928.* 499 pp. 38 figs. Price, $5.50.

The comprehensive nature of hygiene as conceived by the Professor of Hygiene and the Director of the Hygienic Institute of the University of Greifswald is illustrated in this textbook. The guiding principle appears to be development of the physical and social life of man which this science protects from unhygienic modes of life arising from industrial necessities, untoward customs and ignorance. The social art of healthful living in the midst of urban industrial life is the underlying theme. General

theoretical considerations usually conceived as within the field of sociology receive generous consideration, such as movements of population, age at marriage, decline of birth rate, sterility, influences of the industrial age, Taylorismus and Fordismus, and governmental insurance.

The book is an admirable one in its wealth of detail, as, for example, under conditions of health we find discussions in manifold particulars of air, weather and climate, water, soil, clothing, food and nutrition in greatest detail. The personal hygiene of all ages and conditions of men is analyzed especially with reference to the health of the workers in the industries.

The discussion of communicable diseases is far less satisfactory, since it is so abbreviated and condensed.

CHARLES A. KOFOID

Handwörterbuch der Arbeitswissenschaft unter Mitwirkung von 280 Fachleuten des In- und Auslandes —*Herausgegeben von Privatdozent Dr. Fritz Giese.* (*Halle a/S., Carl Marhold Verlagsbuchhandlung.*) *1. Lieferung: Abbau-Arbeitsmedizin.* Columns 1–320 (160 pp.). 1927. Price, RM. 9.00.

This is an ambitious piece of dictionary making which attempts an objective presentation of the data pertaining to labor without favor of concession to nation, party, class or confession. It aims to furnish a systematic, scientific presentation of "Arbeitswissenschaft" in the technical, medical, psychological, legal, pedagogic, industrial, and philosophical aspects. It will be issued in 10 parts, constituting 2 volumes, to be completed early in 1928. The 8-hour day, alcohol, old age relief and old age insurance, worker's psychology, America, and industrial hygiene are among the subjects treated in the first part, and bibliographies are appended to the leading entries. Under "Alkohol" we note an entire omission of American data and no citation of American work. Guinea-pigs, Volstead and abstainers are noteworthy for their absence. The discussion of industrial hygiene contains a useful summary of existing German regulations for the protection of workers from industrial hazards. The work promises to be a valuable summary of current German ideas, custom and practice as regards labor, and therefore very timely for reference and comparison.

CHARLES A. KOFOID

Sanitary Engineering Laboratory Manual—*Arranged by Robert B. Van Horn. Seattle: University of Washington Book Store, 1928.* 23 pp.

This manual, prepared particularly for use in the University of Washington sanitary engineering laboratory, might better be titled so as to indicate application in a water laboratory as it refers only to tests on water.

After brief descriptions of the types of analyses, the sanitary survey, interpretation of results, sampling, and laboratory technic, the author covers laboratory procedures for making physical, bacteriological, microscopic and some chemical examinations. The text is suitable for instruction purposes because of its simplicity and its exclusion of matter not necessary for the use of the beginner.

ARTHUR P. MILLER

The Voyage of Growing Up—*By C. E. Turner and Grace T. Hallock. New York: Heath, 1928.* 192 pp. Price, $.76.

This volume has been prepared for the third and fourth grades and presents health training activities in an interesting manner to children of this school age. A criticism that can be made of this story of the two children who have health adventures is that it attempts to combine mythology, realism and health education. However, the book is charmingly written.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Los Angeles, Calif.—The cover and title page of this report for the year ending June 30, 1928, bear the seal of the city, founded in 1781. An introductory statement of the health officer is that the health department supervises the health of 1,250,000 persons and watches the sanitation of a city of 425 square miles, with a per capita expenditure of 56 cents. Health bureaus have been established in special districts at Venice, San Pedro, Watts, Sawtelle, and Van Nuys, in addition to 23 "health centers" which "provide a personal touch with individual and family units in their own environment."

Following a financial statement are reports of the various divisions. It is noteworthy that the nursing division gives care to the sick in their homes, "at the same time teaching the family the way of healthy living. . . . The expectant mother is taught the principles of personal hygiene, as especially adapted to her needs." The division is now providing nursing care to the policy holders of the John Hancock Mutual Life Insurance Company and the West Coast Life Insurance Company on a fee per visit basis. Good photographs illustrate some of the problems in the nursing field.

Another interesting feature is the account of the city maternity service which received 3,564 applications for care, and supervised 1,334 deliveries. There were 3,540 prenatal calls to patients' homes and 10,513 post partum visits. Attendance at the maternity dispensaries included 3,085 new cases and 9,713 old cases. At this clinic there were 2,611 new cases interviewed by the Social Service Bureau. "We believe that a service which can point to 1,334 deliveries without loss of life to a single mother is a service that is of inestimable value to Los Angeles and to the country as a whole." A group of 8 resident physicians devote their entire time to this work, in addition to a staff of attending obstetricians and consultants.

The object of the dispensaries is to provide medical supervision for those women who are unable to pay for the services of a physician during their pregnancy, regardless of whether they are to be delivered by the service, or expect to go to the General Hospital or to some other similar institution for confinement. Patients are required to go to the dispensary every two weeks throughout pregnancy. A routine Wassermann is done on every new case, and urinalysis and blood pressure readings are taken at each visit. Two social service investigators are employed, but the report recommends that this work be assumed by the Nursing Division under the direction of a social service supervisor.

Seattle, Wash.—Under the title "Your Health Department," the Seattle health and sanitation bulletin, beginning with October, 1927, has carried a series of interesting articles dealing with the health department and health conditions in that city. These articles have been carefully prepared, with headings and sub-headings, charts and photographs, appropriately distributed throughout the series. The activities charted include administration and vital statistics, quarantine, plumbing inspection, milk, meat and dairy inspection, sanitation, laboratories, hospitals and clinics, social service, tuberculosis control, child welfare, garbage collection and disposal, and insect control.

The Commissioner of Health exercises supervision over all health department

activities and is responsible for all policies other than those laid down in the regulations of the State Board of Health or in the ordinances of the city council. The city charter provides that he must be a physician. The commissioner also acts as head of the division of vital statistics, as this "health bookkeeping" is closely related to administration affairs.

Infant mortality rates have declined in this city from 118 in 1905, and 84 in 1910, to 41 in 1927. Three units comprise the child welfare division of the health department, including administration, clinic service and visiting nurse service. The child welfare clinics are primarily for the purpose of keeping well children well. In addition, all the clinical, laboratory, and hospital facilities of the department are available for the purpose of making diagnosis or giving treatment when necessary. The physicians in attendance at the clinics are selected children's specialists. "Some parents fail to bring their infants and children to the clinics. Their children need care and supervision as urgently as those in regular attendance. These children are reached through the efforts of the visiting nurse, who goes to their homes as well as to the homes of those who attend the clinics."

Illinois—The second volume of *The Rise and Fall of Disease in Illinois,* published by the State Department of Public Health in commemoration of its 50th birthday, 1927, is devoted to a history of local health service, and a summary of the work at Chicago and at each of 27 down-state municipalities. Further chapters relate to the sanitary district movement, the tuberculosis sanatorium movement, rural health service, and the sanitary supervision of milk. An appendix contains the annals of health, sanitation, and public health service. It is a well bound volume of 493 pages, and contains a detailed general index as well as an index of auxiliary health agencies, and a bibliography.

The sections of each of the down-state municipalities contain a short history of the public health movement in the city concerned, and a description of the health machinery, water supply, sewerage, and general health conditions. Graphs and tables clearly present the essential vital statistics, and recognition of service is given by picture reproductions of past and present health officers.

The section on Chicago is rendered in greater detail. The health department of the city was established July 19, 1876, taking over the powers and duties of the board of health which had been in existence since 1867. The ordinance provided for a commissioner and an assistant commissioner of health, a secretary and assistant, two meat inspectors and 13 sanitary policemen.

From here the work of the department is reviewed in successive steps, the first being the pre-bacteriologic period, 1876–1892, the first years of which were those of highest death rates, chiefly due to communicable diseases. To combat these, the reporting of contagious diseases by physicians, and the placarding of scarlet fever were made effective in 1877 and diphtheria isolation was started in 1888. However, the more productive work of this period was concerned with the improvement of tenement house and workshop and filth conditions, the surveys leading to the establishment of the Chicago Sanitary District in 1889 and the building of the drainage canal.

The second period, 1892–1906, was that of the control of communicable diseases through applications of the bacteriological principles uncovered by Pasteur and Koch in the 70's and 80's, and the development of food and milk inspection. Dairy inspection was started in 1902, and sanitary inspections of milk depots and bacteriological ex-

aminations of milk samples in 1905. Publicity and education in public health work became recognized as of prime importance, and much attention was given to educational propaganda. The development of quasi-public agencies came in this period, the Chicago Visiting Nurse Association, 1888, Hull House, 1889, Chicago Lying-in Hospital, 1895, Chicago Association of Day Nurseries, 1897, City Club, 1903, and the Juvenile Protective League, 1904. The efforts of the department during the last period, 1907–1927, have been directed toward the systematic control of the various preventable diseases, and the enlargement, on a comprehensive scale, of the other activities of the department, such as the control of the milk supply, meat and food inspection, ventilation, and water supply control.

The sanitary district movement in Illinois, initiated by the establishment of the Chicago district, has grown rapidly in the last few years. In 1911 the creation of the North Shore Sanitary District was authorized, and after the passing of the Act of 1917, which authorized the creation of sanitary districts wherever a desire was manifested by petition, 17 other sanitary districts have been started.

The agitation for tuberculosis control was initiated in the 90's, but proceeded slowly until 1908 when legislation was passed to construct and maintain tuberculosis sanatoriums in cities where desired by popular vote. This led to the gradual growth of the county sanatorium idea which was recognized by legislation in 1915. Since that time 46 counties have been collecting taxes under the tuberculosis sanatorium law, and 15 sanatoriums have been built.

The unfavorable action of the past three legislatures has seriously handicapped efforts toward the establishment of full-time county health officers as the initial step in rural health service. With the aid of the Rockefeller Foundation and the U. S. Public Health Service, however, several full-time county health departments have been organized.

Newark, N. J.—The first page of Newark's 43d report is reproduced because of the information given in a brief space in the introduction.

Newark—A Healthy City

(Population July 1, 1927—467,000)

Outstanding Evidences in 1927	
Crude Death Rate (5,086 deaths) (Lowest ever)	10.9 per 1,000
Adjusted Death Rate (4,837 deaths) (Including Soho & Verona deaths, excluding non-residents)	10.3 per 1,000
Birth Rates (10,042 births) (Lowest ever)	21.5 per 1,000
Infant Mortality (deaths under 1 year per 1,000 living births—lowest ever)	63.3
Typhoid fever mortality	1.3 per 100,000
Tuberculosis mortality (all forms) (Lowest ever)	82.9 per 100,000
Diphtheria mortality	13.3 per 100,000
Scarlet fever mortality	2.6 per 100,000
Smallpox mortality	Not one death since 1903

Among other features, this report has one of the best series of graphs contained in any report during the year. Disease reports are classified by age, sex, month, and wards of the city. A classified financial table concludes the report.

New Haven, Conn.—Bound in gray covers, the report of this city of 184,887 population covers 59 pages. Its attractiveness and readability would be improved by the use of soft paper and larger type for the descriptive text. A good organization chart showing bureaus, personnel, and budget, occupies an introductory page. A resident death rate of 10.0, a birth rate of 19.0, an infant mortality rate of 54.0, a pulmonary tuberculosis rate of 44.3, and a diphtheria rate of 1.6, are reported. There were no deaths from typhoid fever during the year.

Under a new anti-tuberculosis program, with a full-time medical director, nursing service is provided by the Visiting Nurse Association. To assist in the recognition of early cases, the department gives financial assistance for X-ray examinations for patients not in the dispensary group, but for whom the standard charge would be a hardship. An up-to-date register of cases has been prepared. All anti-tuberculosis forces of the community have been coördinated and are working together smoothly and efficiently.

During 1927 nearly 5,000 children were added to the list protected from diphtheria, and of this number 2,000 were babies or in the preschool group. A large proportion of the school group is now protected. Under the auspices of the Health Section of the Community Chest, a comprehensive health survey of the city was undertaken and was completed in 1928. A limited number of copies of the published report is available for distribution to health officers who may desire them.

BOOKS RECEIVED

KEEPING MENTALLY FIT. A Guide to Everyday Psychology. By Joseph Jastrow. New York: Greenberg, 1928. 297 pp. Price, $3.50.

HEALTH AND PHYSICAL EDUCATION. (For Elementary Schools.) By A. F. Myers and O. C. Bird. New York: Doubleday, Doran, 1928. 342 pp. Price, $1.50.

GROWTH. By Robbins, Brody, Hogan, Jackson, Greene. New Haven: Yale University Press, 1928. 189 pp. Price, $3.00.

THE SCIENCE OF NUTRITION. (4th ed.) By Graham Lusk. Philadelphia: Saunders, 1928. 844 pp. Price, $7.00.

HOW TO ENJOY HEALTH. Counsels and Maxims for the Healthy Life. By Claude Lillingston and Norah Hill. London: Hodder & Stoughton, 1928. 287 pp. Price, $1.00.

PROHIBITION STILL AT ITS WORST. By Irving Fisher and H. Bruce Brougham. New York: The Alcohol Information Committee, 1928. 358 pp. Price, $1.50.

NUTRITION IN HEALTH AND DISEASE FOR NURSES. By Lenna F. Cooper, Edith M. Barber and Helen S. Mitchell. Philadelphia: Lippincott, 1928. 574 pp. Price, $3.00.

CHILDREN'S BEHAVIOR AND TEACHERS' ATTITUDES. By E. K. Wickman. New York: Commonwealth Fund Division of Publications, 1928. 247 pp. Price, $2.00.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1928. Washington: Government Printing Office, 1928. 346 pp.

CHILD STUDY DISCUSSION RECORDS. Development—Method—Technique. By Margaret J. Quillard. New York: Child Study Association of America, 1928. 74 pp. Price, $.75.

THE EPIDEMIOLOGY OF LEPROSY IN AUSTRALIA. By Cecil Cook. Commonwealth of Australia, Department of Health. Canberra: H. J. Green, Government Printer, 1927. 303 pp.

NURSING CARE OF COMMUNICABLE DISEASES. By Mary Elizabeth Pillsbury. Philadelphia: Lippincott, 1929. 463 pp. Price, $3.00.

COMMUNICABLE DISEASES FOR NURSES. By A. G. Bower and E. B. Pilant. Philadelphia: Saunders, 1929. 327 pp. Price, $3.00.

HANDBOOK OF MICROSCOPICAL TECHNIQUE. For Workers in Both Animal and Plant Tissues. By C. E. McClung. New York: Hoeber, 1929. 495 pp. Price, $8.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Causes of Puerperal Septicemia—The report of a Massachusetts Committee to investigate deaths due to puerperal septicemia summarizes the causes. Similar investigations in other states ought to have a wholesome influence on maternal health.

ANON. Report of the Committee on Survey of Incidence of Puerperal Septicemia in Massachusetts, 1927. New England J. Med., 199, 25: 1253 (Dec. 20), 1928.

Frequency of Pfeiffer's Bacillus Findings—Pfeiffer's bacillus, found frequently in normal throats at all times, was more frequently recovered from people with colds, much more frequently in pneumonia. There was no correspondence between the incidence of the bacillus and influenza.

BOURN, J. M. Incidence of Pfeiffer's Bacillus in Throats during Epidemic and Interepidemic Periods in Chicago. J. Prev. Med., 2, 6: 441 (Nov.), 1928.

Milk Sickness—An article describing the metabolic disturbances in animals caused by eating the white snakeroot and the effect upon humans consuming milk from sick cows.

BULGER, H. A., *et al.* Milk Sickness and the Metabolic Disturbances in White Snakeroot Poisoning. J. A. M. A., 91, 25: 1964 (Dec. 22), 1928.

Prohibition—Dr. Emerson shows the decrease in deaths from alcoholism and cirrhosis of the liver, and the decline in the percentage of admissions of alcoholic psychoses to mental hospitals, which point to an improvement in public health brought about by prohibition. In addition, he calls attention to improvements in the general and tuberculosis death rates, the decrease in cases of drug addiction, crimes against chastity, the increase in school attendance in upper grades, and the increase of milk consumption, and offers these as evidence of value of prohibition to public health.

EMERSON, HAVEN. Prohibition and Public Health. Survey, 61, 5: 289 (Dec. 1), 1928.

Experiments in Food Poisoning—Heat-killed cultures of nine strains of *Salmonella sp.* when fed on an empty stomach failed to produce symptoms of food poisoning. This experiment gives no support to the theory that outbreaks of food poisoning have been caused by a thermostable toxin of these organisms.

DACK, G. M., *et al.* Unsuccessful Attempt to Produce Salmonella Intoxication in Man. J. Prev. Med., 2, 6: 479 (Nov.), 1928.

Chlorination of Water—This paper reports upon municipal experience in pre-chlorination of water supplies, the use of chlorin in algae control and in preventing sludge putrefaction.

ENSLOW, L. H. Progress in Chlorination of Water. J. Am. Water Works A., 20, 6: 819 (Dec.), 1928.

Regional Vaccination—A translation of a rather flowery account of Besredka's method of local immunization against staphylococci and streptococci. The paper is intended for the intelligent layman.

EPSTEIN, S. Antivirus Vaccines in Surgery. Scient. Month., Jan., 1929.

Health Examinations and Cancer—Periodic health examinations carefully done will discover precancerous

conditions and the earliest evidences of localized cancer. A plea is made for physicians to "expose" themselves to the contagion of enthusiasm for the health examination project. A valuable antidote for such papers as the recent one by Clendening.

FAUGHT, F. A. Health Examinations as a Means of Diagnosis in Cancer Control. Med. J. & Rec., 128, 10: 515 (Nov. 21), 1928.

Midwifery in Great Britain—A brief account of the prenatal and postnatal services established in England. Interesting as a comparison of the work there and in most states of the U. S. A.

FLIEGER, M. L. Midwifery in Great Britain. Am. J. Nurs., Dec., 1928, p. 1194.

Epidemiology of Whooping Cough—An enlightening review of the subject, showing, among other interesting findings, that whooping cough is the most common of the diseases that frequently cause death in the preschool years, and that 95 per cent of all deaths from whooping cough occur during the first 5 years of life. The protection of young children by isolation and vaccination is urged. The preventive campaign is much the same as for measles.

GODFREY, E. S. Epidemiology of Whooping Cough. New York State J. Med., 28, 23: 1410 (Dec. 1), 1928.

Improving Faulty Posture—A discussion of exercises by which posture defects may be corrected by bringing into proper action the antigravity muscles.

HAYNES, R. S. Postural Reflexes. Am. J. Dis. Child., 36, 6: 1094 (Dec.), 1928.

Cod Liver Oil in Milk—A brief note suggesting the substitution of cod liver oil for some of the fat content of milk used in infant feeding.

IRISH, H. E. Cod Liver Oil as a Substitute for Cream in Feeding Mixtures for Infants. J. A. M. A., 91, 24: 1884 (Dec. 15), 1928.

School Lighting Practice—A summarization of the school lighting requirements of 39 states; includes color of walls, exposure, window-floor ratios, intensity of artificial illumination, glare, etc.

IVES, J. E. A Review of the Current Practice of the Lighting of School Buildings in the United States. Pub. Health Rep., 43, 50: 3313 (Dec. 14), 1928.

Immunization against Scarlet Fever—A summary of the successful results in Michigan institutions in immunizing with scarlatinal streptococcus toxin.

KIEFER, G. L. The Value of Active Immunization against Scarlet Fever. J. A. M. A., 91, 24: 1885 (Dec. 15), 1928.

Antituberculosis Work—Another answer to Fishberg's attack on the policies of the N. T. A. The general principles of tuberculosis prevention are discussed and the fallacies of Fishberg's contentions are demonstrated.

KNOPF, S. A. Forty Years of Antituberculosis Work. Med. J. & Rec., 128, 11: 553 (Dec. 5), 1928.

Milk Borne Streptococcus Infections—An outbreak of unusual gastric disturbances in a school was traced to the consumption of milk from a cow with chronic mastitis.

LAIDLAW, F. W. The Epidemiology of an Outbreak of Illness Due to Milk. New York State J. Med., 28, 24: 1465 (Dec. 15), 1928.

Endemic Typhus Fever—The typhus-like disease, which is endemic in the United States, occurs chiefly along the Eastern Seaboard and Gulf Coast with occasional cases reported from the interior and the Pacific Coast. The greatest concentration of cases is found in the southeastern states, particularly Alabama and Georgia.

MAXCY, K. F. The Distribution of Endemic Typhus (Brill's Disease) in the United States. Pub. Health Rep., 43, 47: 3084 (Nov. 23), 1928.

Rural Health Work—A report of the 109 coöperative rural health projects of the U. S. P. H. S. The total of sanitary improvements effected, health educational projects completed, accomplishments in personal hygiene and correction of physical defects, and cases of communicable diseases cared for, makes a most impressive picture of real accomplishment.

LUMSDEN, L. L. Coöperative Rural Health Work of the Public Health Service in the Fiscal Year 1928. Pub. Health Rep., 43, 48: 3149 (Nov. 30), 1928.

Whooping Cough Prophylaxis—In the authors' experience, vaccine proved of little, if any, value in the prophylaxis of whooping cough. He concludes that early diagnosis and quarantine are the only effective control measures.

SAVER, L. W., and HAMBRECHT, L. Whooping Cough. J. A. M. A., 91, 24: 1861 (Dec. 15), 1928.

Preventing Rickets by Irradiation—In a group of 237 babies artificial ultra-violet irradiation was found a practical method of preventing rickets if begun early and given regularly.

SELKIRK, T. K., *et al.* Studies in Rickets. J. A. M. A., 91, 26: 2057 (Dec. 29), 1928.

Cross Connections—The paper recounts water-borne enteric outbreaks due to pollution through cross connections, acts passed prohibiting cross connections, and concludes that, although with specified check valves properly inspected, the hazard is reduced, the sensible procedure is the eventual elimination of all cross connections.

SHERMAN, C. W. Cross Connections—The Health Hazard vs. the Fire Hazard. J. Am. Water Works A., 20, 5: 615 (Nov.), 1928.

Measles Prophylaxis—The Health Department of the City of Syracuse endeavored to supply measles convalescent serum for use in children under 3 years. The principles governing serum prophylaxis are discussed in detail. It is suggested that the extremely low mortality in the large outbreak may have been, at least in part, due to the use of convalescent serum. Experiments with animal serums failed to yield positive results.

SILVERMAN, A. C. Serum Prophylaxis in a Measles Epidemic. J. A. M. A., 91, 23: 1786 (Dec. 8), 1928.

Measuring Ultra-Violet Light—A simple chemical method is suggested for the quantitative estimation of ultra-violet light in sunshine, which correlates closely with the erythema reaction of the skin. The quantity and quality of the available ultra-violet light in Chicago over a period of 16 months are measured and discussed. A most valuable paper.

TONNEY, F. O., *et al.* Actinic Measurement of Solar Ultra-Violet Light and Some Correlation with the Erythema Dose. J. Prev. Med., 2, 6: 493 (Nov.), 1928.

Problems of Old Age—The proceedings of the Annual Graduate Fortnight of the N. Y. Academy of Medicine—a symposium on the problem of Aging and Old Age—are published in this and the succeeding three issues of the Bulletin. It will constitute a valuable record which ought to be in every health library. The four issues may be purchased for $1.00.

VINCENT, G. E., *et al.* Symposium on the Problem of Aging and of Old Age. Bull. N. Y. Acad. M., 4, 11: 1062 (Nov.), 1928.

Heart Disease Studies—Of 500 children in a heart disease clinic, four-fifths had a rheumatic history, the average age of onset of which was 7 years. After 12 years the tendency to infection diminishes. The severity of the rheumatic manifestations bore no relation to the degree of heart involvement.

WILSON, M. G., *et al.* Statistical Studies Bearing on Problems in the Classification of Heart Disease. Am. Heart J., 4, 2: 164 (Dec.), 1928.

NEWS FROM THE FIELD

GIRLS' COLLEGE IN SANTIAGO

THE board of regents of the University of the State of New York has recently granted a provisional charter to the Santiago, Chile, College for Girls. This school was established in 1880, and was originally devoted to the education of girls from America and England, but was later opened to the daughters of Chilean families, many of whom now attend.

This is the second educational institution in South America chartered by the board of regents, the first being Mackensie College of Sao Paulo, Brazil.

SEWAGE RECLAIMED FOR INDUSTRIAL USE AT GRAND CANYON NATIONAL PARK

AFTER much investigation on the part of the U. S. Public Health Service, a sewage disposal plant has been erected and is now in operation on the south rim of the Grand Canyon. The experiment carried on by the federal agency has proved that it is possible to produce continuously a sewage effluent of the same quality as drinking water in so far as bacteriological results are concerned, and of better quality than the original water for generating steam. Authorities are also convinced that where there is a scarcity of water, particularly in the West and Southwest, it will be economically practicable to reclaim sewage for industrial purposes and for irrigating any kind of crops without danger of contaminating ground water or the products grown. The same degree of purification will not be required for sewage which is used for irrigation as for industrial purposes. However, sterilization will be necessary for reclaimed sewage used in growing vegetables and some other crops.

TEAR GAS USED IN FUMIGATION OF SHIPS

POISONOUS cyanogen products have been successfully tried out by the U. S. Public Health Service in the fumigation of ships arriving from foreign ports. The report recently made by the Service accentuates the advisability of using cyanogen products, which include a sufficient amount of tear gas to serve as a warning agent.

TRAVELING DENTAL CLINICS IN THE ANTIPODES

TRAVELING dental clinics giving service in the rural districts of Victoria and Queensland, Australia, have been instituted. In Victoria free dental service is given to school children until they reach the age of 12 years, and in Queensland the treatment of adults is given for a small fee. The location of the dental van is broadcast every Thursday from the Queensland radio station and the immediate itinerary of it given. The Queensland van covered 3,000 miles in 8 months.

ELEVENTH TEXAS WATER WORKS SHORT SCHOOL

THE Eleventh Annual Texas Water Works Short School was held January 14–22, and the convention of the Texas Section, Southwest Water Works Association, was held immediately following, January 23–25, at the Agricultural and Mechanical College and at Bryan, Tex. The short school was arranged under the auspices of the Texas Section, Southwest Water Works Association, the Agricultural and Mechanical College of Texas, the Texas State Department of Health, the City of Bryan and the Bryan and Brazos County Chamber of Commerce. The

school is planned each year to give the water works man of the small city an opportunity to obtain more knowledge of water and sewage treatment and to help him solve his local problems by the laboratory and lecture courses.

COURSES FOR PUBLIC HEALTH WORKERS OFFERED BY JOHNS HOPKINS UNIVERSITY

A COURSE for public health officers and other qualified persons engaged in public health work will be given at the Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Md., during the third trimester, March 13–June 1. The course will include statistics, epidemiology, sanitary engineering, public health administration, bacteriology, immunology, protozoölogy, entomology, helminthology, physiological hygiene, chemical hygiene and the filterable viruses. Lectures will be supplemented by laboratory exercises and field demonstrations.

Candidates for admission to the course must be graduates in medicine or have had scientific training which will fit them for the course.

TRAGIC DEATH OF DR. SILVER AND WIFE

DR. Horatio Silver, 55, Health Commissioner of Preble County, O., and his wife were shot and killed by burglars in their home at Eaton, O., December 8. The robbers entered the bedroom of the Silvers and as Mrs. Silver rose from her bed she was killed by a bullet through her heart. Dr. Silver was shot in the stomach and died five hours later at a Dayton hospital.

A daughter aged 13 occupying a room across the hall from her parents was awakened by the shots and her screams aroused the neighbors. The murderers escaped and county police authorities have not been able to identify them from the inadequate description of them given by Dr. Silver on his deathbed. The robbers obtained only $10 in cash, taken from Dr. Silver's trousers pockets.

INFLUENZA IN LOS ANGELES

WALTER M. Dickie, M.D., State Health Officer, Berkeley, Calif., reports that Los Angeles County had had 5,182 cases of influenza up to December 1 in the present outbreak, while the total for the state under observation at that time was 8,712. In Los Angeles, 600 new cases were reported December 6, and in the first 6 days of December there were 2,821 cases, among which there had been 70 deaths.

DR. BRISTOL RESIGNS FROM MILBANK MEMORIAL FUND

LEVERETT D. Bristol, M.D., Fellow A. P. H. A., executive officer of the Bellevue-Yorkville Health Demonstration, has resigned to accept a position in the industrial health field. Dr. Bristol has been with the Milbank Memorial Fund Health Demonstrations in New York for 6 years as executive officer.

PERSONALS

DR. EDWARD T. DEVINE has been appointed director of the Bellevue-Yorkville Health Demonstration, New York, N. Y., to fill the vacancy caused by the resignation of Dr. Leverett D. Bristol. The announcement of Dr. Devine's appointment was made by Shirley W. Wynne, M.D., Health Commissioner of New York City. The local health department is using the Bellevue-Yorkville Health Demonstration district as a health labora-

tory to try out public health programs. This demonstration is one of three being financed in part by the Milbank Memorial Fund.

DR. ARTHUR H. GRAHAM, Wetumpka, Ala., head of the Elmore County health unit, has been promoted to the position of District Health Officer of southeastern Alabama, comprising 19 counties, and Dr. Lewis Roy Poole, Dothan, Ala., has become head of the Elmore County health unit.

DR. CHARLES A. DIMOND has been named city physician of Keokuk, Ia., to succeed Dr. William Frank Brown, resigned. Dr. Dimond was formerly city physician for several years.

DR. EDWARD S. GODFREY, JR., director, Division of Communicable Diseases, New York State Department of Health, has been appointed clinical professor of epidemiology of the College of Physicians and Surgeons, Columbia University.

DR. CHARLES A. WATERHOUSE, Health Officer of the Sherman consolidated health district in Chautauqua County, N. Y., since 1919, died December 5 from pneumonia.

DR. ARTHUR T. DAVIS, executive secretary of the Delaware State Board of Health, was recently appointed Health Officer of Suffolk County, Del.

DR. GEORGE H. COOMBS, director, Divisions of Social Hygiene and Communicable Disease, of the Maine State Board of Health, resigned in December to resume private practice in his former home, Waldoboro, Me. Dr. Coombs served with the Maine State Department of Health for 8 years.

DR. A. E. MCCLUE, for some time director of the full-time health unit of Hancock County, W. Va., has resigned to enter private practice. His successor is Dr. James E. Fisher of Ohio, who has done much public health work in Alabama.

DR. MARSHALL C. BALFOUR, who until October served as director of the Field Training Station for the Mississippi flood area at Indianola, Miss., has been assigned to the New York City office of the International Health Division of the Rockefeller Foundation, to succeed Dr. Charles N. Leach, who has been transferred to a European post. Dr. Balfour has had extensive experience in public health work in this country and in Europe. From September, 1926, to July, 1927, he was engaged in malaria investigations in North Carolina.

DR. ABRAHAM J. COHEN, Philadelphia, Pa., has been appointed chief of the Division of Tuberculosis of the Municipal Bureau of Health to succeed the late Dr. Thomas Mellor Tyson. Dr. Cohen has been medical director of the Eagleville (Pa.) Sanatorium for 19 years and has served also as assistant director of the Henry Phipps Institute.

CONFERENCES

February 15, Conference of State and Local Health Officials of New Jersey, Trenton, N. J.

February 21–23, Ninth Annual Convention of the Progressive Education Association, St. Louis, Mo.

February 23–March 2, Parents' Exposition, New York, N. Y.

February 24–28, National Education Association, Cleveland, O.

FOREIGN

April 3–6, Permanent International Committee on Occupational Diseases, Lyons, France.

July 13–20, Fortieth Congress and Exhibition of the Royal Sanitary Institute, Sheffield, England.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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Age Distribution in Milk-Borne Outbreaks of Scarlet Fever and Diphtheria*

EDWARD S. GODFREY, JR., M. D., FELLOW A. P. H. A.

Director, Division of Communicable Disease, State Department of Health, Albany, N. Y.

THAT there has been an unusual proportion of adult cases in milk-borne outbreaks of scarlet fever, seems first to have been noted by Littlejohn in 1899.[1] Ker,[2] in his textbook, gives it not only as a characteristic of scarlet fever but of diphtheria as well. More recently, Clarke[3, 4, 5] has called attention to the phenomenon and suggested its value as a means for the early diagnosis of milk-borne outbreaks.

Strangely enough, although this peculiarity has been noted in the reports of numerous outbreaks, the only allusions to it as a characteristic appear to be those quoted, all of which are from Edinburgh authorities. Ker,[2] indeed, thought this might be merely a local characteristic due primarily to the extensive use of milk on porridge by Scotch adults. Of the 9 diphtheria outbreaks cited by Clarke,[6] however, 5 were in England.

The only allusions to this peculiarity as a characteristic of milk-borne infection that I have found in American literature are in the pamphlet on scarlet fever published by the U. S. Public Health Service in 1914,[6] in an article of my own on outbreaks attributed to pasteurized milk,[7] and in the recent study by Armstrong and Parran.[8] There has not been, so far as I am aware, any inquiry to determine how frequently this peculiarity shows itself nor to account for its occurrence.

With the idea of contributing something toward the answer to the

* Read at a Special Session on Epidemiology of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

first of these questions, I have tabulated by age all of the cases attributed to milk-borne infection with scarlet fever and diphtheria that have occurred in New York State since 1914, and all of those found in recent literature in which the age distribution has been given. Further, through the courtesy of S. J. Crumbine, M.D., I have received the names of places in the United States that have been reported to him as having had milk-borne outbreaks of scarlet fever and diphtheria since 1923. By following these up I have been able, either through the state directors of communicable diseases or the local health officers, to obtain the age distribution in 11 outbreaks of scarlet fever and 2 of diphtheria.* Altogether a series of 21 outbreaks of scarlet fever comprising 1,362 cases, and 11 outbreaks of diphtheria comprising 709 cases have been collected. These outbreaks are listed in Tables II and III. No outbreak in which exposure was limited to a special age group has been included.

A higher incidence in children is generally accepted as a charac-

TABLE. I

PERCENTAGE OF CASES BY AGE IN MILK-BORNE INFECTIONS AS COMPARED WITH INFECTIONS FROM ALL SOURCES

	Column 1 Typhoid			Column 2 Scarlet Fever			Column 3 Diphtheria		
	A		B	A		B	A		B
Ages	Milk-borne *		All cases †	Milk-borne *		All cases †	Milk-borne *		All cases †
Years	No.	Per cent	Per cent	No.	Per cent	Per cent	No.	Per cent	Per cent
Total	919			1,105			241		
0–4	66	7.2	4.5	206	18.6	17.4	24	10.0	22.2
5–9	147	16.0	13.8	269	24.3	38.0	39	16.2	34.8
10–14	131	14.2	14.3	174	15.7	23.1	32	13.3	17.8
15–19	131	14.2	14.2	119	10.7	8.4	26	10.8	7.0
20–29	168	18.2	21.7	195	17.6	7.9	49	20.3	8.7
30–39	118	12.9	14.0	80	7.2	3.8	30	12.4	5.6
40–49	77	8.4	9.3	37	3.3	1.0	22	9.1	2.5
50–59	43	4.7	5.3	17	1.7	0.3	11	4.6	1.0
60 and over	38	4.2	2.9	8	0.7	0.1	8	3.3	0.4
10 and over		76.8	81.8		—	—		—	—
15 and over		—	—		41.4	21.5		60.5	25.2
				Age Ratios					
−10 : 10+		1 : 3.31	1 : 4.47		—	—		—	—
−15 : 15+		—	—		1 : 0.70	1 : 0.27		1 : 1.35	1 : 0.34

* In New York State 1917–1926

† New York State places of less than 200,000, 1915–1924, Vol. 1, *Annual Report* New York State Dept. of Health for 1925.

teristic of milk-borne typhoid fever outbreaks. In order to test the general truth of this observation and to ascertain its constancy, I have examined our New York data comprising 64 typhoid outbreaks, with 919 cases of known ages, attributed to milk-borne infection. These have been tabulated by age by individual outbreaks and then assembled for the entire series and the percentages by age periods calculated. The latter are presented in Table I, Column 1A. For comparison, the percentages by the same age groups for all typhoid cases in places of less than 200,000 in New York State are given in Column 1B. It is seen that 7.2 per cent of the milk-borne cases are under 5 years of age as compared with 4.5 per cent for all cases, an excess of 60 per cent. The excess is 27 per cent in the age group 0–10 years and 45 per cent at ages 60 years and over. Our figures therefore tend to confirm the observation that children are unusually liable to attack in milk-borne typhoid, but indicate that this liability is largely due to the excess at ages under 5. They further indicate that people over 60 years of age are relatively more subject to attack from milk-borne typhoid than younger people over 5 years of age.

Columns 2A and 2B show corresponding percentages for scarlet fever. Here we see that there is a slightly higher percentage of milk-borne cases at ages under 5 but markedly lower percentages at ages 5–9 and 10–14. The excess at age 0–4 is about 8 per cent, but the deficiency at 5–14 is 35 per cent. At all ages over 14 there is a consistently higher percentage of cases in milk-borne scarlet fever than in scarlet fever from all causes. It will be noted too that the relative excess grows greater with each succeeding decade as age increases.

Column 3 shows the corresponding percentages for diphtheria. We note that there is not an excess of milk-borne diphtheria at ages 0–4 but a deficiency of over 50 per cent. At ages 5–14 the deficiency is 25 per cent while in every age group above 14 there is an excess which increases relatively just as in scarlet fever.

Although, for reasons which will be explained later, the figures of certain outbreaks have not been used in calculating these percentages for scarlet fever and diphtheria, the omissions do not change the result much. It seems to be true then that a high age incidence is a general characteristic of milk-borne scarlet fever and diphtheria and not merely a peculiarity dependent primarily on an unusual age distribution in the consumers. Not only this, but it is much more marked than the incidence among children in milk-borne typhoid fever.

The next question is to determine how constantly this characteristic appears in individual outbreaks. Table II lists each of the outbreaks of scarlet fever for which satisfactory age data have been se-

TABLE II

AGE RATIOS IN MILK-BORNE OUTBREAKS

SCARLET FEVER

	Total Cases	Ratios −15 : 15+	Per cent of cases over 15 years
N. Y. All cases 1915–24 *	66,951	1 : 0.27	21.5
N. Y. Rural cases only †	24,031	1 : 0.32	24.4
Wappingers Falls, N. Y., and vic. 1915	53	1 : 0.66	39.6
Ossining, N. Y. 1921	24	1 : 0.33	25.0
Croton, N. Y. 1922	68	1 : 1.62	61.8
Huntington, N. Y. 1922	90	1 : 0.76	43.3
Buffalo, N. Y. 1923	59	1 : 0.26	20.3
Cohoes, N. Y. 1924	20	1 : 0.67	40.0
Binghamton, N. Y. 1925	39	1 : 0.77	43.6
Troy, N. Y. 1926	14	1 : 1.00	50.0
Deposit, N. Y. 1926	34	1 : 1.13	50.0
Bristol, Conn. 1924	125	1 : 0.67	40.0
Flint, Mich. 1924 ‡	100	1 : 1.04	51.0
Pittsfield, Mass. 1924	7	1 : 0.00	0.0
Clinton, Mass. 1925	56	1 : 0.81	44.6
Netcong and Stanley, N. J. 1925	50	1 : 0.82	34.0
Scio, O. 1925	50	1 : 0.47	32.0
(?), Minnesota 1926	67	1 : 0.43	29.9
St. Johns, Mich. 1926	73	1 : 0.43	30.1
Kalispell, Mont. 1927 **	150	1 : 0.70	41.3
Washington, N. J. 1927	199	1 : 1.06	51.8
Janesville, Wis. 1928	21	1 : 1.63	61.9
LaCrosse, Wis. 1928	63	1 : 0.50	33.3
Total milk-borne cases	1,362		
Average		1 : 0.75	39.2
Median		1 : 0.70	40.0

* Places of less than 200,000 population
† Cases occurring in unincorporated territory
‡ Ice cream
** Ages over 30 years not distributed

cured. Three of these have not been used in calculating the percentages in Column 2A. The outbreak in Flint, Mich.,[20] was not used because the infection was transmitted through ice cream and therefore probably exposed a greater percentage of older people than milk ordinarily would. The Pittsfield, Mass., outbreak was excluded because there seemed to be a question as to the sufficiency of the evidence incriminating milk. While I do not pretend to have gone into the evidence in each of these out-of-state outbreaks, it has been fur-

nished and examined in several instances and in the others I have assumed that it was adequate because of the sources through which the age data came. The age distribution in this Pittsfield outbreak was so far out of line that it was queried and the response was not satisfactory. It was felt that in an outbreak of this size the exclusion of other possibilities should be made with considerable care before acceptance.

The only reason for excluding the Kalispell, Mont., outbreak was the grouping of all cases 30 years of age and over. The evidence was ample but the figures could not be used in calculating the percentages for the decades beyond 30, and their exclusion made very little difference in the percentages under 30.

Column 2 of Table II shows the ratio of the number of scarlet fever cases under 15 years of age to the number 15 years and over. For comparison, this ratio is given for all scarlet fever, regardless of mode of infection, as it occurred in places of less than 200,000 in New York State. Also, since the age incidence tends to rise as congestion decreases, this ratio is given for the unincorporated places only in New York State. Running down this column we find, aside from the Pittsfield outbreak, one (Buffalo) in which the ratio is less than that for all places less than 200,000. This ratio is probably a little higher than for the general run of cases in a city the size of Buffalo, but it certainly is not enough higher to be significant or to be useful as an indicator. In this outbreak the evidence incriminating the milk supply was quite conclusive. All of the cases were on one milk route; they occurred explosively; there was sufficient dispersion to make school or neighborhood contact improbable; and 6 unrecognized cases had existed for nearly two months on a dairy farm supplying milk to this dealer.

There are 5 other outbreaks in this list in which the ratio is less than twice that for rural New York. If we take this ratio as a criterion, this characteristic is present in significant proportions in 70 per cent of milk-borne outbreaks of scarlet fever. Applying this criterion to the 15 outbreaks of typhoid occurring in New York State since 1916, involving 19 cases or more each, there was a significant percentage of cases under 5 years of age in only 40 per cent of them. Under 10 years of age there were only 2 out of the 15 that had twice the percentage usually found in typhoid from whatever cause.

Table III is a table for diphtheria corresponding to Table II for scarlet fever. The figures of two outbreaks in this list were not used in calculating the percentages in Table I—the one in Rhode Island[11] because it was an ice cream outbreak and because the age distribution

beyond the 15th year was not given, and the Westchester County outbreak because it was transmitted by certified milk and hence largely limited to small children. The latter affords the *only* instance in which the ratio of cases over 15 was less than in the general run of cases either in New York State or in its rural districts only. The only other outbreak in which the ratio fell below twice that of rural New York occurred in Suffern, and here it will be noted that it approaches this criterion very closely.

It cannot be definitely determined whether a high ratio of adult cases of scarlet fever or diphtheria necessarily means milk-borne infection; probably it does not, even if outbreaks occurring among groups of adults in camps and institutions be excepted. A recent non-explosive outbreak of diphtheria in rural New York was confined almost exclusively to adults and was apparently spread by contact alone. Such an occurrence, however, would require somewhat exceptional conditions, and in this connection it should be remembered

TABLE III

AGE RATIOS IN MILK-BORNE OUTBREAKS

DIPHTHERIA

	Total Cases	Ratios −15 : 15+	Per cent of cases over 15 years
N. Y. All cases 1915–24*	50,254	1 : 0.34	25.2
N. Y. Rural cases only†	13,446	1 : 0.45	30.9
Lincoln, Neb.....1913	110	1 : 1.39	58.2
Suffern, N. Y.....1915	13	1 : 0.86	46.1
Middletown, N. Y....1916	18	1 : 1.57	61.6
Rhode Island and vic. 1916‡	402	1 : 1.58	61.2
Westchester Co., N. Y. 1920**	66	1 : 0.27	21.2
Saranac Lake, N. Y...1922	16	1 : 3.00	75.0
Painesville, O.....1924	23	1 : 0.92	47.8
Stoneham, Mass.....1925	24	1 : 3.80	79.2
Olean, N. Y.....1925	14	1 : 1.33	57.1
Alexandria Bay, N. Y. 1926	12	1 : 1.40	58.3
Mexico, N. Y.....1926	11	1 : 2.67	72.7
Total milk-borne cases	709		
Average		1 : 1.71	
Median		1 : 1.40	58.3

* Places of less than 200,000 population
† Cases occurring in unincorporated territory
‡ Ice cream
** Certified milk

TABLE IV

DATA ON DEPOSIT, N. Y., OUTBREAK OF SCARLET FEVER

Ages Years	Total Persons on Route: Pop. on Route	Attacked	Attack Rate Per cent	Milk Drinkers Only: Pop.	Attacked	Attack Rate Per cent
Total	255	34	13	129	32	25
0–4	24	3	12.5	12	2	17
5–9	22	9	41	21	9	43
10–14	22	4	18	12	4	33
15–19	22	5	23	12	4	33
20 and over	165	13	8	72	13	18
0–15	68	16	24	45	15	33
15 and over	187	18	10	84	17	20

that a high percentage of young children is not an infallible indication of milk-borne typhoid. It is sometimes found in water-borne typhoid if the community has had either a high endemic rate or has been subject to outbreaks at short intervals. In an outbreak in Watervliet, N. Y., in 1917, out of 120 cases of known age, 28 per cent were in children under 10.

I have not attempted an explanation of the phenomenon, partly because of limited space, but principally because of the limited data on which to base or by which to test any theory that might be evolved. The most obvious theory, namely that the exposure of adults is increased *relatively* more than the exposure of children, does not seem to be borne out in the two small outbreaks (shown in Tables IV and V). These are the only outbreaks for which I could obtain a census by age of the dealer's customers.

TABLE V

DATA ON MEXICO, N. Y., OUTBREAK OF DIPHTHERIA

Ages Years	Total Persons on Route: Pop.	Not immunized	Attacked	Rate—non-immunized
Total	63 or 66	49 or 52	11	22 or 21
0–4	3 or 5	1 or 3	0	0
5–9	4	3	0	0
10–14	12	8	3	37.5
15–19	6	5	2	40
20 and over	38 or 39	32 or 33	6	19 or 18
0–15	19 or 21	12 or 14	3	25 or 21
15 and over	44 or 45	37 or 38	8	21

In the Deposit, N. Y., outbreak (Table IV), satisfactory data on the use of milk by each individual on the route were recorded.

It will be seen that the attack rate in adult milk drinkers is only about one-third less than in children. In the Mexico, N. Y., outbreak (Table V), the attack rate in adults is equal to or only slightly less than it is in children, making no allowance for the milk drinking habits at the different ages. These tables are submitted not because they prove or disprove anything, but merely to illustrate the kind of data we shall have to accumulate before the explanation can be reached.

In conclusion, I would say it will always pay to investigate the milk supply whenever an unusual *number* of adult cases of scarlet fever or diphtheria occur in a community. Suspicion should be excited by an unusual *number* of adult cases occurring within a limited period. Milk-borne outbreaks which are non-explosive do occur and a still greater number of them lack explosiveness in their beginnings. The practical application of this age characteristic therefore may lead, as it has in Edinburgh, to the early recognition of milk-borne scarlet fever and diphtheria and to correction of the cause.

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9. I am indebted to the following for their assistance in securing the data respecting outbreaks in their states or communities:
S. J. Crumbine, M.D., General Executive, American Health Assn., New York, N. Y.
Howard A. Lanpher, M.D., Epidemiologist, Dept. of Health, Hartford, Conn.
C. L. Scamman, M.D., Director, Division Communicable Diseases, State Health Dept., Boston, Mass.
Don M. Griswold, M.D., D.P.H., Deputy Commissioner of Health, Lansing, Mich.
O. McDaniel, M.D., Director, Division Preventable Diseases, Minneapolis, Minn.
D. C. Bowen, M.D., Director of Health, Trenton, N. J.
C. P. Robbins, M.D., Chief, Division Communicable Diseases, State Health Dept., Columbus, O.
J. Milton Scott, M.D., Health Officer, Scio, O.
H. M Guilford, M.D., Director, Bureau Communicable Diseases, State Health Dept., Madison, Wis.
F. L. Leister, M.D., Health Officer, Marshfield, Wis.
Fred Welch, M.D., Health Officer, Janesville, Wis.
A. M. Murphy, M.D., Health Officer, LaCrosse, Wis.
E. E. Epting, M.D., Director, Anderson Co. Health Unit, Anderson, S. C.
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The Tuberculous Worker and His Placement in Industry*

CHARLES W. BERGQUIST

President, Chicago Tuberculosis Institute; Superintendent Public Relations, Western Electric Company, Chicago, Ill.

IN considering the question of the tuberculous worker and his placement in industry, attention should naturally first be given to those points which would justify the consideration of this particular disease over other diseases.

During the past 25 years the mortality rate from tuberculosis has been reduced more than 50 per cent. Despite this continual and appreciable decline, tuberculosis is still the most destructive and fatal disease among wage earners throughout the United States. It is very prominent as a cause of death between the ages 15 and 44 years. About 1 death out of every 4 in this age group is due to tuberculosis.

Nearly two-thirds of all deaths from tuberculosis occur during that period of life when a person is of the greatest economic value to his family and yet is most insecure financially. Louis I. Dublin, Ph.D., in his recent book *Health and Wealth,* states that mortality rates for both sexes, although practically the same up to 10 years of age, are considerably higher for females than for males during the next 15-year period.

The white female rate is highest at about 26 years of age, when it is 138.3 per 100,000. The white male rate reaches its maximum at about 52 years of age, when it is 214.1 per 100,000.

Beyond the age 30 the rate for both sexes drops rapidly, and continues among white persons throughout the rest of life below that of males.

Although heart disease, pneumonia and cancer lead tuberculosis in causes of death among the people of the United States, tuberculosis really faces the competition of only heart disease. Both cancer and pneumonia are diseases which occur more frequently in an older age group, and they are different in cause and character. Four-fifths of all deaths from heart disease occur in the group over 40 years of age; in tuberculosis, death usually occurs at an earlier age.

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

The long period of illness resulting from tuberculosis makes it one of the most costly diseases both in the expense for proper care and treatment and in the money lost by the wage earner during his sickness. Moreover, the records of the Association for Improving the Condition of the Poor in New York City show that tuberculosis predominates as a cause of dependency.

Because of these facts, I believe it is entirely logical to give consideration to the detection of tuberculous employes, their proper placement and care, and a rehabilitation program for those who return which will make them eventually self-supporting and an asset to their families and to the community.

It has been estimated that a tuberculous patient is under care for an average of 2⅓ years. For an additional year at least he is probably unable to earn his normal wage. He is, therefore, during this entire period, a nonproductive workman, deprived of his income and faced with abnormal expenses for the treatment of himself and the maintenance of his family. It is quite necessary that during these years he be under close medical supervision which will help him to regain his place in industry. The rehabilitation program, therefore, has come to be recognized as the most important phase in the patient's after-sanatorium treatment.

Assuming at the outset that the patient will return to his former occupation if possible, the plans for his rehabilitation should go forward while he is in residence at the sanatorium—and if possible should be considered a part of his treatment.

INDIVIDUAL RESPONSIBILITY

Generally speaking, tuberculosis is most prevalent among families with small incomes whose home conditions and environment are not conducive to the building up and maintaining of body resistance.

Unsatisfactory working conditions may tend to stimulate a tubercular lesion already present, but the position and habits of life of the patient outside his working environment doubtless play a more important rôle in his disability. The 8 hours now generally accepted as the working day are not as responsible for tuberculosis as are the 16 remaining hours in which the individual follows his own inclinations. In commenting on this phase of the subject, the editor of *Nation's Health* made the following editorial comment about a year ago:

> Tuberculosis among industrial workers has always been an interesting health problem and often a controversial one from the standpoint of social and economic responsibility. It is an accepted fact that tuberculosis does not arise from industrial processes any more than do measles, scarlet fever, or other communicable diseases.

The workman's environment in early life has a profound influence on his later years as far as this disease is concerned, for we know that in many cases the infection has taken place in childhood.

Such studies as have been made in individual factories, presenting no special hazards, have shown a tuberculosis rate comparable to the general community, or about 2 per cent.

Because of the comparative ease with which industry can provide facilities for diagnosing tuberculosis and other disabilities, it has a certain responsibility in the matter. But until the personal responsibility and social environment of the patient have been properly evaluated, industry should not be charged with both social and economic consequences of this disease.

SANATORIUM TREATMENT MOST EFFECTIVE

There are three essential facts to be considered in connection with a study of tuberculosis. Tuberculosis is communicable; tuberculosis is preventable; tuberculosis is curable. The earlier the diagnosis, and the sooner the treatment is started, the better is the chance for recovery.

Without proper treatment the progress of the disease cannot be combated successfully, and authorities agree that there is no place where a patient with tuberculosis can be treated so well and learn so much about taking care of himself as in a good sanatorium.

If adequate facilities for the treatment of a case can be found in a nearby sanatorium, the patient will gain several advantages: Transportation expenses will be reduced; visits from members of the family can be more frequent, thus helping to develop a good mental attitude on the part of the patient; the physician representing the industry in which the patient worked can follow the progress of the case much more effectively; and in many instances there will be less opposition from the patient himself if he knows that the sanatorium to which he is going is not located at any great distance from his home.

Dr. Allen K. Krause, Editor of the *American Review of Tuberculosis,* and on the staff of the Johns Hopkins Hospital, is authority for the following statement:

> The day when tuberculosis sufferers went to other climatic regions for treatment is passing and the trend of treatment of tuberculosis during the last generation may be summed up in one word—" sanatoria."
>
> For a long time the trend has been away from climatic treatment. It has been established that the tuberculosis patient in all stages of the disease can regain health or be greatly and permanently improved by the proper treatment near home in practically every section of the country. Nevertheless, for those who can afford it, the right climate to be selected for the individual case has certain advantages.
>
> The best of climates is not to be recommended for any patient who might suffer any undue strain in mind, body or purse to obtain it. For practically every patient, the proper treatment means sanatorium treatment at some time during the

course of the disease, this preferred at the beginning in nearly every case. To delay or temporize is to court disaster and eventual failure.

The leading medical authorities agree that hospitalization of the tuberculous has played an important part in the decline of this disease. It has been stated that the death rate from tuberculosis is lower in communities showing the highest average hospital days per tuberculous patient. It is quite important, therefore, to impress upon the tuberculous patient the advantages of sanatorium treatment versus treatment at home. The added expense of sanatorium treatment would be justified in the earlier return to work and financial independence of those afflicted with the disease.

Close observation must be maintained not only up to the time when the patient may be discharged from a sanatorium but during the subsequent periods when, under the supervision of a physician or skilled social worker, he is being trained gradually to return to his former occupation. The usual penalty for the lack of such supervision is a probable recurrence of the trouble with less probability of recovery.

PHYSICAL EXAMINATIONS

In the industry with which I am associated there was an apparent increase in 1927 in the number of incipient tuberculosis cases among the 25,000 employes, one-third of whom are women. However, a detailed study and analysis of all cases proved that this increase in the number of cases reported was due not to unfavorable working conditions but to a policy of the medical department to examine thoroughly for potential tuberculosis every employe who reports to the hospital because of illness, especially of the respiratory type.

In the physical examination of new employes special attention is given to the lungs and respiratory tract in order to detect any possible tendency toward tuberculosis.

In any industry, occasionally cases of tuberculosis will develop despite precautions. When such a case occurs, every effort should be made by the employer to assist the employe in his fight for health.

Many of the larger cities maintain and operate tuberculosis sanatoriums. The Municipal Tuberculosis Sanitarium of Chicago is such an institution. It is operated under the direction of a board of trustees of which the health commissioner is a member. This sanatorium enjoys a reputation for efficiency and high professional standards.

However, it usually is not possible for any municipality alone to provide adequate facilities for all the tuberculosis cases in the community. Industry, therefore, should establish a close contact with some recognized private or semi-public sanatoriums where industrial cases may receive proper treatment.

If we are to make further progress in the fight against tuberculosis in industry, industry itself must stand ready to support these institutions and their local tuberculosis associations.

Whole-hearted participation in such activities will bring dividends in community good will, lower manufacturing costs for the industry and better employe relations.

Naturally, in deciding upon the amount of financial assistance that the employe needs to secure adequate treatment, the employer must consider the patient's obligations to his family as well as his ability to finance himself during an illness which will last at least 6 months and may extend over a period of 1 or 2 years.

If an employe is eligible through membership in a company plan mutual benefit association, or disability insurance, to receive sickness benefits, any further help from the employer should be determined largely by the employe's family obligations and his available financial resources. In any event he must not be denied prompt and proper treatment for the disease.

Experience has taught us that it is advisable to discharge a patient from a sanatorium as soon as the case has been arrested. This practice is very effective in helping to maintain a good mental attitude. At the same time, the average patient at this stage has not usually recovered his health to the extent of returning to his former occupation on a full-time basis.

The real value to the man, in so far as his mental attitude is concerned, comes from the fact that in leaving the sanatorium he is returning to his former environment. This is effective in assuring him of the employer's desire to place him again at his former work as soon as he is physically able to perform it.

An employe with an arrested case of tuberculosis should not believe he must be treated differently from other people. He is not a menace to his associates even though occasionally there exists an impression that he is.

Drs. Vogeler and Lyman and many others have for years recommended that, wherever possible, the employe should endeavor to readjust himself to his old occupation.

In the book, *Advising the Tuberculous about Employment,* by Hamilton and Kidner, the following paragraph appears at the beginning of the chapter, "Selecting an Occupation":

> Generally speaking the tuberculous adult should be advised to seek employment in which he can capitalize the knowledge and skill gained through his previous life and employment experience. . . . A complete change of occupation is advisable only when there exists in the former occupation hazards known to be dangerous for the tuberculous.

In leaving a sanatorium, an employe is confronted with the problem of his medical supervision during the period of his readjustment in industry. This should rest with a representative of the medical department where such service is maintained by the industry, or with a physician who may be delegated for this specific work. During the time the employe is in the sanatorium, this representative should follow the case so that upon his release a rehabilitation program may be inaugurated with which the employe is in full accord. Throughout this training program, the length of which will vary with the physical condition of each employe, the medical department should give the employe frequent physical examinations and at least once a year a complete examination by a tuberculosis specialist.

If this supervised program is to be successful, it must include three aids to complete physical and vocational rehabilitation:

1. A hardening-up process of a somewhat more continued and scientifically constructed character than can be carried on at a sanatorium
2. A vocational training adapted to the patient's needs and temperament
3. Placement in work best suited to the patient's own physical condition and training

To insure the best results from such a rehabilitation program will necessitate an expenditure of money sufficient to meet the difference between a normal wage and the amount the employe may receive during the time he is being readjusted to industrial life. This expense is justified on the ground that such a program will shorten the period of absence after discharge from a sanatorium.

CONCLUSION

In conclusion let me briefly summarize the various points which I have attempted to emphasize throughout the presentation of this paper:

1. Tuberculosis is still the most destructive and fatal disease among wage earners.
2. Tuberculosis is communicable, preventable, and curable.
3. After an early diagnosis of tuberculosis is confirmed, it is necessary that the patient receive prompt treatment.
4. Successful treatment requires supervised care, preferably in a sanatorium.
5. The death rate from tuberculosis is lowest in communities showing the highest average hospital days per tuberculosis patient.
6. Lack of accommodations in free tuberculosis institutions makes it necessary for industry to support and coöperate with private sanatoriums.
7. It is not only safe but advisable for an employe with a controlled, arrested case to return to his old occupation.
8. During a training period when the employe is being readjusted to his former work, a rehabilitation program should be carried on under the supervision of a carefully selected and trained personnel.

So much has been accomplished by the medical profession, municipal health authorities and such organizations as the National Tuberculosis Association and its affiliated bodies in the prevention of tuberculosis through education and clinics, that industry must now take its part in caring for employes who become afflicted.

The far sighted industrial leader will incorporate in his program of curative measures a very definite plan for the rehabilitation of arrested cases. This will be done not only for economic reasons but for humanitarian reasons.

Just as industry has reduced accidents and has found that it pays, so will those same industrial leaders learn that a reduction in time losses through sickness will likewise pay real dividends.

DISCUSSION *

C. W. Bergquist, Chicago, Ill.—I am not a physician but I am connected with a large Chicago plant which employs 25,000 to 35,000 workers, one-third of whom are women, and which has had an extensive medical and nursing department for twenty years. We find that preliminary medical examinations, which have been made for years, are very helpful to our employes as well as to the plant, and many persons predisposed to tuberculosis have been kept from working in situations which might have been hazardous to them. I take a decided issue with those who think industry should take no part in health education in a broad way.

Emery R. Hayhurst, M.D., Ohio State University, Columbus, O.—The survey by Mr. Coleman has shown that the industrial side of the problem of tuberculosis is realized in many parts of the country. Since the tuberculosis program is " sold " to the public it is decidedly advantageous to make use of it for advances against the 2 per cent or more tuberculous found in industry. The tuberculosis dispensary may well refer the cases found to the industrial medical service of the plants so equipped, which services ought to check up health hazards, particularly in regard to ordinary ventilation, overheating and stagnation in work places. But the dispensary should refer the case which comes from a small plant directly to the local health authorities, who should investigate the work place. I would not imply that the work place is the sole cause of the promotion of tuberculosis, but the 8 to 10 hours a day spent at work usually have a direct influence in the downhill course of the case.

I think the Philadelphia plan is to be commended to other cities. It has been pointed out that the rise and fall of tuberculosis mortality in England for the past 75 years is an economic problem—hard times, and even political measures, which depress industry, invariably resulting in higher rates.

While at the Dublin Congress at the Royal Institute of Public Health this summer, I heard a very interesting paper by Dr. P. C. Varrier-Jones, Director of the Papworth Village Settlement for Tuberculosis, the paper being accompanied by two films of the colony and its factories. There are some 2,000 tuberculous indi-

* Discussion here presented covered, not only Mr. Bergquist's paper but also Extension of Industrial Hygiene by Tuberculosis Associations in the United States, by Bernard S. Coleman, in the February issue, page 157.

viduals now employed in this colony, where the families also live, and all are under constant medical supervision. Such a colony demonstrates that a tuberculous person can work at various factory processes and improve in condition at the same time. Economic, social and psychic factors are all satisfied. Of course, the object of this colony is the cure of tuberculosis first, and manufacturing production second, although it is practically paying expenses.

The post-war industrial depression in Great Britain has appeared to result in lessened morbidity and mortality, probably because workers are out of the factories and in the open air, and the "dole" system is undoubtedly benefiting many of them. However, it is necessary to wait to see the effects on the tuberculous. I think we should regard tuberculosis as universal in the human race, much the same as weeds in the garden, and that it is only by constant supervision and "cultivation" that we can keep the disease down.

Many positive results have already been obtained through industrial efforts such as those pertaining to the printing and publishing industry. I am not convinced that the work place is the only place to search for tuberculous persons associated with a given plant, because only those who are at work at the time or period are examined, while past workers and occasionally those absent are overlooked. We would not think of gauging the status of measles in a community by the number of cases found in the school house at a given time, but we would search the neighborhood and look for past cases, and I think such should be done in searching out the industrial relations of tuberculosis.

Eugene L. Fisk, M.D., Life Extension Institute, New York, N. Y.—I have an idea that the peak rate of tuberculosis among young women appears unduly prominent because any publicity concerning women is easy to get. The real question is whether the tuberculosis rate for young women is decreasing more slowly than for young men.

J. A. Goldberg, Ph.D., New York Tuberculosis and Health Association, Inc., New York, N. Y.—We have been making a study of tuberculosis in the rock drillers of New York City, those in connection with foundation construction work, subways, etc., and we find that they suffer from silicosis and from tuberculosis. The medical side of the investigation has been conducted by Dr. Haven Emerson's Department in Columbia University. The report is shortly to be published in the *Journal of Industrial Hygiene,* but at this time I am able to state that the reported 2 per cent found in industry is far too low for those on this job; also, we could not get at many who were away from the job, sick at home, etc.

Daniel J. Kindel, M.D., Consolidated Coal Company, Inc., Fairmont, W. Va.—Dr. Wright has thrown a bomb shell by estimating industrial tuberculosis at 5 to 10 per cent instead of 2 per cent or lower. My company, which employs about 10,000 workers, would, therefore, have possibly 500 employes with active tuberculosis. It is a huge problem at any percentage, but we want a very careful study before we accept these figures. While our preventive medical service is still young, we have so far found nothing like this rate.

Eugene L. Fisk, M.D.—I know of an instance where a plant employs 10,000 workers with "no tuberculosis," according to the plant physician. Hence, why worry!—There is a lot to do here and we cannot feel overly proud of the country's record thus far. The "periodical health examination is a murderer," some say, but is this an emotional disturbance or a fact?

Wade Wright, M.D.—I am not a pessimist in any sense of the word. However, Dr. Kindel selects workers for coal mining, and the coal fields have always been known to have a low tuberculosis rate. I insist that the 2 per cent usually found does not show the true situation. It is probably nearer 5 per cent. The Metropolitan Life Insurance Company, after pre-employment examinations, sends about 200 persons a year to its sanatorium. Do not be deceived regarding the greatly decreasing prevalence of tuberculosis despite a declining mortality.

Volney S. Cheney, M.D., Medical Director, Armour & Company, Chicago, Ill.—The industry has a part to perform in taking care of tuberculous employes, but only a small part—healthful working conditions. Leave the home relations and social aspects to outside agencies organized for that purpose. Such is not a part of industry's job, although industrial managers from a humanitarian standpoint often do this. By many the individual is considered a part of the industry, but I say he is only a temporary part; this is, while he remains there. Hence, why take complete care of him? The insurance company is more concerned than industry in this. At present we have a difficult time in advancing the industrial medical department because it cannot show definitely where it pays, as in the case of other departments in the plant. We receive tuberculous cases from the Chicago Tuberculosis Institute and its dispensaries and coöperate by placing them in the most favorable locations in our plant. We ought to examine our employes more often, at least twice a year, but with 12,000 employes and a labor turnover of 150 a day, because our employes are proverbial floaters, we cannot afford to do it. Many of our workers are reëxamined several times a year as it is, since they go from one plant to another. Let the laborer share part of this burden and the industry will do its part.

A. J. Lanza, M.D., Metropolitan Life Insurance Company, New York, N. Y.—The points of view here presented are not so far apart as might be thought. Each speaker gives only his own experience and viewpoint and these tend to distort the whole picture. The intelligent employer (and the big employer is usually an intelligent employer) is more and more recognizing that the employe's health and welfare is an industrial responsibility. It is there whether he likes it or not. The employer is forced to recognize it because of economic pressure. In Chicago I saw a plant employing 800 high-class machine tool workers where, to maintain their production, the management gives attention to many things, such as the food eaten by the employes, illumination, ventilation, even the use of the newer type of window glass admitting ultra-violet rays, annual examinations of the eyes, etc., etc. All this is done because they feel it helps them to meet competition and to maintain their reputation for reliable goods.

Eugene L. Fisk, M.D.—The touchstone is evidently coöperation, not paternalism. The employe is a copartner and, if treated so, he will stay on the job; therefore his health interest, from all points of view, is a part of the necessary organization.

Tuberculosis in Racial Types with Special Reference to Mexicans*

BENJAMIN GOLDBERG, M. D.

Municipal Tuberculosis Sanitarium of Chicago, and the Department of Pathology and Bacteriology, University of Illinois College of Medicine, Chicago, Ill.

THE health of the people is the supreme law." The physical and mental stamina of the individual determines the physical and mental stamina of the race. One would suppose that legislators and lawmakers, both state and national, who are responsible for the peace, happiness and prosperity of the state and nation, should also be responsible, in the larger sense, for national public health, without which there can be neither peace, happiness, nor prosperity. Comparatively few physicians seriously enter the field of politics and comparatively little attempt is made by the medical profession to influence legislation in the matter of big race health policies.

If it is a question of importing livestock from abroad, special consideration is given to the quality of the stock, the breed, the ancestry, prevalence or absence of disease or epidemics, and the susceptibility of the given breed to epidemics or disease in their new environment. Even in the matter of livestock shipments between the states, certain laws and regulations are enforced for the purpose of protecting the animals which will be exposed to the new arrivals.

Let us now consider human immigration. To the eye of the public health man the barriers and weirs erected in the stream of human immigration are inadequate and too few. The stream is not analyzed for its health inheritance, for its resistance to disease, for its health reaction to its new environment.

Fortunately, the health inheritance of our immigrants, for the most part, is the health inheritance of the older, civilized races. Most of the races admitted have run the gamut of disease, have had bitter experience with tuberculosis, syphilis, acute contagious diseases, have, perhaps, as far as the individual disease is concerned, gone through the ordeal of the "survival of the fittest," have lost uncounted numbers of susceptibles and finally, at the end of a trail beset with suffer-

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ing and disease, have reached the haven of comparative racial immunity. Some of the European peoples coming to our shores, for instance the Swedish and Irish, have not, perhaps, passed all the way along the trail.

There are, however, other races not of the old European stock, who seek admission to the United States, whose entrance in considerable numbers must under present circumstances be considered as a public health menace. The public health man is not inclined to accept the famous saying of Thomas Jefferson at its face value. If Jefferson had been conversant with present-day problems in public health, he would have had to modify his statement that "all men are created equal."

The official interested in public health must realize, as a first principle, that all men are not created equal; that there is no equality between either the health of individuals or the health of races; that there is a health heredity as part of the biologic heredity; and that health heredity is vitally different in different races. Even the health heredity of the various population units in the United States—the difference in racial susceptibility to disease—has always been with us a burning public health problem.

The Indian, within the confines of the United States, met civilization and was overwhelmed by the diseases of the white man. He was unsuited in every way for urban life. He alone was the loser; his race died out without serious repercussion on the health of the white man.

The negro offers a public health problem of a different nature. Prior to his contact with white civilization, and immediately after his entrance into this country on the plantations of the South, he was practically free from tuberculosis. Today the negro is tending more and more toward urban life, and coming in greater and greater numbers to highly tuberculized communities. Frequently he is infected with tuberculosis in the urban centers and spreads infection both among his own race and among the whites.

In Chicago, in 1927, the negro mortality was 401.8 per 100,000, over 6 times the mortality of the white race. Nevertheless, he is adaptable and in time will, without question, develop sufficient relative immunity to enable him to cope successfully with city life. Meanwhile, the process of immunization is costly. The care and supervision of the negro in the matter of tuberculosis alone over the time during which he is increasing his resistance to civilization diseases necessitates the expenditure of huge sums of money.

At the present time in Chicago we have 8 tuberculosis dispensaries for the entire population, and of these, 3 are devoted almost entirely to the service of the negro. This means that while the negro consti-

tutes only 5 per cent of our population, he is receiving 37 per cent of our tuberculosis service. Last year $836,021.30 was expended by the Municipal Tuberculosis Sanitarium for field work in Chicago. On the basis already stated, $309,327.86 was expended on the negro receiving the services of these 3 dispensaries.

The negro, as an essential element in our American population, is entitled to this greater consideration, and this increased expenditure. He is an American citizen, entitled to all the prerogatives and rights of such citizenry. Both for his own sake and for the sake of the white race his problem must be met as effectively as possible; he must be given, during his probationary period in urban life, all the safeguards that science can command.

There is, however, another race which has no demand on us and which is rapidly introducing among us a health problem as serious as or even more serious than the health problem of the negro. I refer to the Mexican. We seem, throughout the United States, to be asleep to the menace of the immigrant Mexican. Confronted with the problem in Chicago, I took occasion to investigate the literature and was amazed to find that practically no consideration has been given to this problem in this country. In view of this, I took occasion to write to the health officials in states and communities which have a large Mexican population and was surprised to learn that even in those communities in which the Mexican was admittedly a most serious health problem, no thorough data had been compiled and no effective remedial measures even suggested. The Mexican is coming in thousands, bringing with him his health standards, his susceptibilities, bringing potentialities for deterioration in national health which few of us even begin to realize.

TUBERCULOSIS IN THE PRIMITIVE RACES

Before going further with the subject of the Mexican as a health menace, it may perhaps be advisable to roll back a few pages of history and study the reaction of the so-called primitive races to civilization and to its diseases, particularly tuberculosis.

The American Indian—We see very little in recent literature concerning tuberculosis and the American Indian. The Indian has, unfortunately, solved his own problem—he is dying out. However, in the literature of a couple of decades ago, many terrible descriptions are available concerning the inroads of tuberculosis among the American Indians.

Coming down to recent times, we find that in the mortality tables covering the U. S. Registration Area for the year 1924, the total mor-

tality from tuberculosis in Indians was 680.3 per 100,000. The estimated total population of the Indian in the same area in 1924 was only 98,920, and of this number 673 died of tuberculosis in one year.

Further examples, considering tribe after tribe, might be furnished to demonstrate the devastation wrought by tuberculosis among American Indians. The Indian, as explained, was the only one to suffer. Fortunately for the white man, the Indian was inadaptable to city life; he did not migrate to the city, and did not, in consequence, broadcast tuberculous infection among the whites. If he had developed the qualifications of a city dweller, the Indian would have constituted a serious public health problem; he would have added fuel to the flames, thrown oil on the smoldering embers and, undoubtedly, many of his white brothers would have been consumed with the Indian in the conflagration.

This is a point not sufficiently realized. It may be thought because the Indian, ravaged with tuberculosis, has had little influence on general health in the United States, the same proposition will hold concerning the negro and the Mexican. It must be emphasized, however, that the negro and the Mexican do not live apart in reservations; they live in densely populated urban centers in contact usually with the lower grades of the white race. These classes of whites, owing to economic conditions—food, housing, etc.—are the members of the white race most prone to tuberculosis. It must be quite obvious then that the increased tuberculosis morbidity in the negro and the Mexican will have its repercussion on that portion of the white race which comes into close personal contact with these susceptibles.

The Filipino, the South American Indian, and the native African all have had cause to regret the white man's civilization. The ravages of tuberculosis in these and other primitive races have been in direct proportion to the degree of intimacy and contact with the coughing white man.

The Negro in This Country—As already intimated, the negro in the United States constitutes a tuberculosis problem entirely distinct from that of the Indian. The negro is rapidly being urbanized, and this undoubtedly increases the tuberculosis mortality and morbidity in the negro race.

A review of the situation must make it clear that this urbanization of the negro cannot take place without having a deleterious influence on public health in general. The negro from the South is being swept in ever increasing numbers into highly tuberculized communities. He there meets infection and is infected; he there also helps to spread infection. He has many points of contact outside of his own race, and

acts as a medium for further dissemination of tuberculous infection in the community. The negro tuberculosis mortality in Chicago is double or treble what it is in the cities of the South. For instance, in 1926, in Mississippi, it was 161 per 100,000 as against a negro mortality in Chicago of 389 per 100,000 in the same year.

Notwithstanding an intensive campaign, and despite all measures at our command, the tuberculosis death rate in Chicago has, during the past few years, shown a slight increase. The lowest tuberculosis death rate recorded for the City of Chicago was in 1922 when the rate was 78.3 per 100,000. This rate has gradually risen until in 1927 it reached 82.7 per 100,000. Statistics indicate that this rise is due to the greatly increased number of susceptibles in our population.

The outstanding fact revealed by these figures is that among the white elements in our population, the mortality rates have definitely improved. The improvement, however, is not reflected in the general mortality rate because it is more than offset by the increased tuberculosis mortality in the negro.

Mexicans—In 1927, 68 Mexicans died of tuberculosis in Chicago. These Mexicans were classed as white on the death certificates; therefore, in estimating our white mortality we must deduct these 68 Mexican deaths.

In discussing the magnitude and complexities of the negro health problem we have but one object in view. Public health men throughout the country understand and evaluate this problem with sufficient precision. It is used merely as a yard stick for the measurement of another tuberculosis problem which menaces us, and which, if steps are not soon taken, will prove even more serious than that of the negro. The Mexican of tomorrow will bring to our towns and cities dangers which will strain the resources of the local and national public health agencies to the utmost. We have discussed the subject of tuberculosis in primitive races merely to bring out the ravages among the Mexicans as they go through the process of urbanization. We have tried to indicate that in this process the Mexican will not be like the Indian, for he will not suffer alone; he will be infected and in turn will broadcast tuberculosis in the community. Like the negro he has and will have many points of contact with our native American population. As Mexican immigration increases he will have still more points of contact. It is a question that we must face now or submit to serious consequences later.

Shall we allow the Mexican, who has no claim on us, to develop in our midst the same serious problem that the negro, who has a claim on us, has developed? Shall we allow the unrestricted immigration

of susceptible aliens? Shall we allow them to go through the process of urbanization in our communities, and to undergo the complex, little understood and tedious process of resistance development? Are we logical if we protect with one hand and destroy with the other? Are we logical if we try to use all scientific means to protect our native American population from tuberculosis, and at the same time allow an unrestricted stream of susceptibles to enter our communities to become exposed and to kindle the fires as fast as we extinguish them?

PRESENT STATUS OF IMMIGRATION LAWS

Until 1924, Mexicans were permitted free entry to the United States. Starting in 1924, the Mexican immigrant was required to pay an $8.00 head tax and a $10.00 visé fee. He was also supposedly obliged to pass a medical examination and literacy test, but this has not been enforced. He was, strange as it may seem, not on a quota as are the European nations.

Statistics quoted by Kenneth L. Roberts in articles appearing in the *Saturday Evening Post* show definitely a marked increase in Mexican immigration. In 1907 only 91 Mexicans entered the United States through the portals of legal entry. In 1926, 66,000 Mexicans immigrated to this country. In addition, all authorities concede that at least as many Mexicans enter the United States illegally as enter legally each year.

MEXICAN POPULATION IN THE UNITED STATES

In the opinion of Mr. Roberts, there are at present in the United States 3,000,000 Mexicans, that is, individuals either born in Mexico or with one or both parents born in Mexico. This estimate does not, of course, take into consideration the great population of the Southwest, which is of Mexican descent.

Since 1920 the stream of Mexican immigration has steadily increased. The immigrants, pouring first into the Southwest, California, the orange groves, the industries and mines, later, in ever widening circles come to the beet fields and orchards of Michigan, and to the factories and mills of Detroit, St. Louis, Chicago. The fruit and vegetable growers of the Imperial Valley of California, the industrialists and mining magnates of the Southwest, the railroad magnates, the factory owners, the industrialists of the West and Middle West, must have their Mexicans. The good news travels. The Mexicans in their native country hear of riches, opportunity, good food, free hospitals, and free medical care in the United States. They hear that they can earn in a day what they cannot earn in a week in Mexico.

They are not bothered by the head tax or the visé. The Rio Grande is long, their hopes are high, and they come to the Eldorado.

Good health and proper living standards are related. What are the Mexican's standards of living? In Chicago he lives either in the box-car or in the colony.

If he makes his home in the box-car he lives where his job is. Half a dozen or more obsolete box-cars are drawn up on an unused railroad siding; they have been slightly altered and furnished in primitive fashion for habitation purposes. There is usually no provision for light or ventilation except by means of the door. As space is a consideration, as many Mexicans as possible are crowded into a restricted space. There is, of course, no running water, in fact, very little of any kind of water, and there are no toilet facilities. The Mexicans in these box-cars are in the position of Trudeau's rabbits in the cellar. Susceptible as they are, it is difficult for them, under such circumstances, to escape infection if one of their number is tuberculous.

The Mexican colony is a crowded, unhygienic home, where there are congestion, open tuberculosis and exposure.

THE TUBERCULOUS MEXICAN IN CHICAGO

Though there are many other health problems which the Mexican brings with him, this paper is confined to the problem of tuberculosis. In 1927, 387 Mexicans were admitted to the general wards of the Cook County Hospital. The situation became acute and it was borne in on us that energetic measures were necessary. A survey was consequently planned and carried out along the following lines.

The nurses were first sent out into the districts and instructed to locate, as far as possible, the Mexican families. Five nurses and five physicians were assigned to the work. The nurse first called on the families and made appointments for examinations. The physicians who did the examining called, for this purpose, either in the evening, on Saturday afternoon or Sunday morning. It was realized that home calls made by the physician during regular working hours would be ineffective; the wage earner, who was often the affected one, was at his work in the railroad yards or the stock yards and could not, of course, be examined.

In this survey, out of a total of 1,197 Mexicans examined, 24 were diagnosed as tuberculous, and 254 were placed under observation as suspects. In other words, 2 out of every 100 Mexicans examined were affected with tuberculosis, either pulmonary, bone or gland. According to these figures the morbidity in Mexicans is 10 times greater than that in the general population.

In 1928, there were 534 Mexicans under the supervision of the Municipal Tuberculosis Sanitarium. Of these, 380 were classified as observation cases or suspects; 154 were definitely diagnosed as tuberculous, of whom 83 were cases of pulmonary tuberculosis. Accepting the Consul's estimate of 7,000 Mexicans in Chicago, we have, therefore, a ratio of 12 pulmonary cases for every 1,000 population. This figure is to be compared with the ratio of 3 pulmonary cases per 1,000 population, considering all nationalities.

The mortality rate indicates a truer picture. In 1927, 68 Mexicans died of tuberculosis in Chicago. From these figures we are amazed to note that 12 Mexicans died of tuberculosis in Chicago for every 1 Chicagoan of the general population who succumbed to the disease.

A detailed study of 230 charts of the pulmonary cases showed that 93 per cent of the patients in question were in Chicago for a period of 5 years or less; 86 per cent were in Chicago 4 years or less; 24 per cent, or one-fourth of the patients, had been in the community less than 1 year. It must be unequivocally evident, then, that the Mexican in Chicago, as elsewhere, is a serious social liability.

As a further check-up a survey of the Mexican patients treated in the tuberculosis ward of the Cook County Hospital was undertaken by one of our dispensary physicians, Dr. J. J. Mendelsohn. It was found that Mexican admissions for tuberculosis amounted to 15.2 per cent of the total Mexican admissions to the hospital.

With regard to the occupation of these 63 patients treated at the Cook County Hospital, the tabulation brought out the fact that practically all the Mexicans were unskilled laborers. The Mexican is below medium stature, of inferior muscular development and under excessive labor demands will rapidly break.

It was found that 85 per cent of the patients were in the later stages of the disease when admitted to the hospital. It is evident, therefore, that the Mexican is difficult to reach with public health measures. He shuns doctors and clinics and spreads infection freely in the community until forced, by absolute physical disability, to seek help.

It was found that 19 per cent of the Mexicans in the tuberculosis ward of the Cook County Hospital had been in Cook County less than 1 year. Thirty-seven, or 64 per cent, had resided in Cook County for a period less than 3 years. The mere statement of these facts should be sufficient to emphasize the urgency of our Mexican tuberculosis problem. At the present time we have a population of only about 7,000 Mexicans. This population, however, is rapidly increasing, re-

cruited from the west by primitive Mexican stock coming to Chicago as transient labor.

In 1927, 50 Mexican-born patients died of tuberculosis in Chicago. Of these 50 patients 32, or 64 per cent, died as charity patients in the Cook County Hospital. While statistics on the point are not available at the moment, it is safe to say that practically all of the remaining 18 patients were subjects for charitable care and assistance.

It was found that 47 per cent of the patients died within 1 month after admission. The summary of Mexican deaths from tuberculosis brings out two facts: First, it emphasizes the observation already noted that the great majority of patients come to Cook County Hospital in the advanced stage of the disease; and second, that the Mexican, like other primitive races, is subject to acute and subacute types of tuberculosis.

Our tables also indicate a progressive increase of Mexican deaths in our charity institutions. In 1922, with an estimated Mexican population of 2,500 we had 12 Mexican deaths from tuberculosis at the Cook County Hospital, while in 1927 from a Mexican population of 7,000 we had 32 tuberculosis deaths in Cook County Hospital. In each instance, therefore, 5 Mexican patients died in the Cook County Hospital for every 1,000 of Mexican population. We see, consequently, that the problem multiplies as the Mexican population multiplies and in exact, direct ratio.

SUMMARY

Our political and social leaders are not sufficiently interested in the race problem as it affects health. The industrialist and agriculturist in the West and the Southwest, in importing Mexican laborers, are also importing a race "sizzling with susceptibilities." In view of this fact a thorough physical examination of every Mexican immigrant is a public health essential.

The public health official is "tilting at windmills" in his attempt to reduce tuberculosis mortality if tuberculous susceptibles are allowed to flock into his community in droves. The Mexican will not, like the Indian, suffer or die alone, but will increase dissemination of infection in the community in which he was infected.

The immigration laws which restrict the quota of some of the older European peoples, comparatively immune to tuberculosis, are not effective in restricting the immigration of Mexicans, a race highly susceptible to tuberculosis. The gain to the industrialist in cheap wages is more than counterbalanced by the loss to the taxpayer in increased charity expenditure.

The 7,000 Mexicans already in Chicago constitute a problem. Who will solve the problem when the Mexican population amounts to 200,000 or 300,000? With an estimated negro population of 170,000 it has been found necessary to devote 3 of our 8 dispensaries, or 37 per cent of our entire tuberculosis facilities, to the care of the tuberculous negro. The Mexican in urban life, according to figures available, is even more susceptible than the negro. An increase in Mexican population to 150,000 or 200,000 would practically monopolize the remaining 5 dispensaries. As dispensary operation costs on an average $104,502.66 per year for each dispensary it will be readily understood that the increased expenditure will be an enormous drain on the taxpayers.

REMEDIAL MEASURES, IF ANY

We have considered the problem from its various angles. Is there any remedy? The pessimist will say that the problem is out of the hands of the public health officials, that immigration officials and political leaders are not sufficiently impressed with the seriousness of the question to propose or enforce sufficiently energetic measures.

We believe that at least some of this laxity on the part of our lay officials can be laid at the door of public health and professional men. We do not make sufficient effort to educate the members of our state and national legislative bodies concerning the important health questions of this kind. We have made no effort, as far as I am aware, to reach the industrialist and agriculturist who are prime factors in the importation of Mexican labor. They can, however, be convinced that their success and prosperity are bound up irrevocably with the health and prosperity of the community and that part of the taxes for increased charitable expenses will have to come out of their pockets.

Health agencies, municipal leaders and the officials of social agencies should make greater effort to gather dependable statistics relative to Mexican immigration. They should present these statistics through the proper channels at Washington and allow the figures to speak for themselves. This should result in placing on the statute books an immigration law which would cope not only with this situation but with any subsequent public health problem of a similar type that may arise, and would in some measure offer a health protection to the American citizen.

All peoples of all races seeking admission to the United States should be subjected to thorough physical examinations, and in those races that are susceptible to special diseases, as is the Mexican to tuberculosis, special attention should be given to that particular disease.

Almost every large city in this country has, in its sanitary code, housing laws which should protect the individuals adequately against the danger of a contagious or infectious disease through congestion or overcrowding. Laxity of enforcement of such regulations should, in the presence of a menacing condition, be laid at the door of the health officer responsible for such enforcement. The box-car on the railroad siding should come under this category and be controlled from this standpoint. In the event that interstate travel is an evading issue for this type of movable home, the U. S. Public Health Service would, we feel certain, control such a situation.

If adequate housing facilities were provided by the industries utilizing this type of labor, and individual segregation in the home were possible, a lessening of congestion would result in a lessening in the spread of disease.

The industrialist, educated to the danger which occurs in the employment of basic, primitive races, should be educated further to provide an adequate medical inspection and examination service in order to detect the disease in its early stage, and weed out the physically unfit, thereby also preventing the spread of the disease.

Our federal statutes allow the deportation of any individual who enters this country, resides here for a period of less than 5 years, and becomes a public charge by virtue of physical disability or other cause. This deportation legislation, unfortunately, is not utilized to the extent that it should be in the various communities throughout this country, and consequently the financial burden in such communities, from the public health standpoint, becomes very large.

CONCLUSION

We in Chicago, as in other cities throughout the United States, are face to face with a special menace, and this special menace demands special measures. We need action; it is not the moment for passivity or indifference.

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DISCUSSION

GODIAS J. DROLET

Statistician, Research Service, New York Tuberculosis and Health Association, New York, N. Y.

THE Chicago tuberculosis authorities and Dr. Goldberg should be congratulated upon their open-mindedness in placing before the Vital Statistics Section of the American Public Health Association their Mexican tuberculosis survey results before their publication.

Dr. Goldberg would modify the statement of Jefferson that "all men are created equal." I agree with him that undoubtedly all men are not *now* created or born equal—but human flesh was originally and it may even be said that under similar *previous* and *present* environments it is being created equal. Tuberculosis susceptibility or resistance can, under similar circumstances, be developed equally.

Personally, I do not like the phrase about the Mexican that he is of "another race, which has no demand upon us." We stripped the Mexican of California, Arizona, New Mexico, and of Texas. Now, when he is willing to labor for us, we would begrudge him life itself. Knowing the inherent devotion of Dr. Goldberg to the sick, I do not think he really intends all the implications of such a statement.

The Mexican is indeed a composite Indian-Negro-Spaniard, descendant of races all accustomed to sunlight and fresh air. He must, indeed, suffer terribly in the dusty, cloudy, choking cities, but may it not be, just as the negro has been found relatively immune and more resistant to hookworm infection and to certain digestive disturbances, that the old Indian stock does bring along favorable genes against the vagaries of American climate—with possible beneficial qualities against the high pneumonia incidence now prevailing in the implanted human stock in America —and some better body growth capacities, upon native food (corn, tomatoes, potatoes), than Europe's transplanted flowers.

The best contribution of Dr. Goldberg's paper is, of course, the figures of the Mexican survey in Chicago, and the results of the actual examination of 1,197 individuals of that group.

From their findings, the Chicago authorities compute a tuberculosis morbidity rate of 20.05 per 1,000 examined, and say that "in Mexicans it is 10 times greater than in the general population," basing this upon the fact that 7,798 cases of tuberculosis were reported in that city last year, and therefore that they had already figured a general tuberculosis morbidity of 2.51. But in the above, first of all, the ratio of 2.51 to 20.05 is not 10 to 1, but only 8 to 1; second, there is a statistical error in attempting to compare the two on the same basis. The Chicago morbidity rate of 2.51 is for only *new* cases reported in the city during the year, and not for the total old and new in the entire city on a given date (which is usually at least twice as high a number), whereas the Mexican figures are for the total tuberculous in their group on a given date, including both new ones of recent accession and perhaps, as in any other group, the old ones of a previous year. Furthermore, the Mexican figures are based upon a presumably thorough examination and complete reporting of all their cases, whereas the general Chicago figures are of no such careful and complete origin. In my opinion, therefore, I would first say it is probable that the total tuberculosis incidence rate of Chicago on a given date is perhaps 5 per 1,000 population, and that the Mexican morbidity ratio to that of the general

population is nearer being under 4 to 1. This necessary correction, however, certainly does not break down the seriousness of the figures of the incidence of tuberculosis among the Mexicans in that city, though it may reduce their relative importance.

Considering the mortality rate among Mexicans of 970 per 100,000 we have, however, in Dr. Goldberg's figures an undoubted evidence of the seriousness of the situation in this group.

The necessity for finding remedies against tuberculosis brought in by new racial groups is well expressed by Dr. Goldberg. Personally, however, I question whether merely a thorough physical examination of incoming Mexican immigrants will be the solution. That type of examination does not sort out susceptibles; it would not exclude a husky, handsome, strongly built Irishman, or a blue-eyed Scandinavian arrival, and yet both, under actual test of city life, may break down most piteously with tuberculosis. Shall it be a tuberculin test? shall it be a careful history taking? shall it be but a general realization of the disease susceptibilities of certain groups, and a particular consideration of the specific dangers they will encounter? or shall it be a more definite supervision in cities of such groups? It is hard to say what is the solution, but all must be thought of.

Chicago should be congratulated upon the earnestness and ability with which their tuberculosis authorities are facing their responsibilities. Dr. Goldberg has helped us to appreciate once more that the tuberculosis problem in our cities reflects a composite picture, deeply affected by the various racial groups already within, or coming into the community, and that he offers us a practical example on how to face it by study and intelligent attention.

Child-Welfare Work of the Sickness Insurance Funds in Germany

THE sickness-insurance funds of Germany, which are a part of the compulsory social insurance system of that country, have been devoting particular attention to child welfare work in recent years.

Considerably more than half of the sickness-insurance funds have extended their sick benefits to the children of insured persons. Preventive work with children has been emphasized, and as part of this work provision has been made for dental treatment and gymnasiums, ultra-violet ray clinics, clinics for diseases of the throat and nose, etc. Moreover, in recent years the sick funds are also making greater provision for treatment of children of insured persons in recuperation homes and sanitariums.—*Zentralbl. f. Jugendrecht und Jugendwohlfahrt,* Berlin, Sept., 1928, p. 158.

Health Demonstrations*

GEORGE C. RUHLAND, M. D., FELLOW A. P. H. A.

Health Commissioner, Syracuse, N. Y.

WITHIN the past ten years or so there have come into existence, especially in the United States and Canada, undertakings of a specialized kind that are commonly referred to as "health demonstrations." They are all more or less of the kind for which the well-known demonstration at Framingham may be taken as the prototype.

Among these demonstrations may be listed: the four receiving aid from the Commonwealth Fund,[1] at Fargo, N. D., Athens and Clark County, Ga., Rutherford County, Tenn., and Salem, Marion County, Ore.; those helped by the Milbank Memorial Fund[2] in Cattaraugus County, N. Y., Syracuse, N. Y., and the Bellevue-Yorkville District of New York, N. Y.; the demonstration in Mansfield, Richland County, O.,[3] toward which the American Child Health Association and the Red Cross gave support jointly; the demonstration in Montreal[4]; the work in the East Harlem Health Center, New York, N. Y.[5]; and the special tuberculosis study in the Dubois Health Center, Detroit, Mich.[6]

It seems entirely proper to mention, in this connection, also the contributions by the Rockefeller Foundation[7] to the budgets of rural health service in 207 counties in 24 states, as well as the coöperation of the U. S. Public Health Service[8] in demonstration projects in 86 counties, or districts comparable to counties, in 18 states.

This list of health demonstrations might be still further extended, without counting similar undertakings in foreign countries, by including cities in this country in which, through assistance from such agencies as the Commonwealth Fund, Rockefeller Foundation, The American Child Health Association, Metropolitan Life Insurance Company, and other sources, demonstrations in mental hygiene, child guidance and other specialized health problems have been undertaken.

As most of these undertakings have been operating for only a brief number of years, it would be unfair to pass judgment at this time on their value. Nevertheless, it seems permissible to venture some general observations on the subject of health demonstrations.

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* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

What has brought them into being at this time? What is the thought underlying the promotion of health demonstrations? On what plans are they undertaken? and are these sound? What response is there to them? Are they worth while? These are some questions that might properly be asked, and for which an answer seems, at least in part, available.

What has brought about the development of health demonstrations at this time? As an answer to this question, the following, quoted from the introduction of a report[9] by The American Child Health Association on 5 years of its activities, may conveniently serve.

> When, however, in 1920 the war draft figures were published, they gave a picture of conditions that startled us out of our complacency. They showed that about 70 per cent of all the men of draft age were physically below normal. At the other end of the line, we were told that 80 per cent of our children were born perfect. That meant in this great country of ours, with its comparative freedom from poverty, its ample space, abundant food supply and general excellence of climate, where, if anywhere in the world, children should have a right to health, that in the arc between birth and maturity were accumulating conditions which robbed the youth of this nation of their full heritage of health and happiness. Here in our own country was a job that challenged us.

This is the reason given by the President of The American Child Health Association for the formation of that organization, and this undoubtedly is the reason that has quickened the formation of the various undertakings of health demonstrations throughout the length and breadth of this country as well as elsewhere.

The stimulating or accelerating factor in the development of health demonstrations does not primarily seem to have been an appreciation of the economic value of human life. That appeal had already been ably made, in the *Report on National Vitality*, prepared by Professor Irving Fisher for the National Conservation Commission in 1909,[10] but had not been productive of any undertakings in the field of health conservation comparable with the present-day health demonstration movement.

It was obviously the emotional appeal of impressive statistics taken from the report of the Draft Board against the background of the dramatic setting of the recent war which essentially hastened the development of the special health activities known as "health demonstrations" within recent years.

It should be clearly understood, however, that in suggesting the emotional appeal as influencing the development of health demonstrations, this is to apply only to the acceleration of this movement, and not to the underlying motive which prompted their undertaking.

The justification for health demonstrations rests fortunately on a far firmer basis.

The foundation for health demonstrations is, of course, the same as for all other health work; namely, a recognition of the economic value of human life; an appreciation of the costliness, and therefore the undesirability of sickness; the right of society to protect itself against sickness, and its hurtful effects; an understanding of the fact that public health is made up of individual health, and an acceptance of practices and procedures tried and proved for the purpose of disease prevention and for the preservation and promotion of health.

There manifestly is in all of this nothing that marks or differentiates the work of health departments from that of health demonstrations, nor does it appear from all that is available on the work of health demonstrations that these are intended to function in any way other than in conformity with these fundamentals. There is nothing experimental about health demonstrations except in the technic of establishing modern health procedure in a given community, and in so far as the relationship of humans to one another is always experimental.

The purpose of health demonstrations and the reason for their being appear to be essentially this—an effort by demonstration to advance the education of the public in matters that have been tried and found good in disease prevention and health promotion.

The movement that has stimulated and is aiding health demonstrations recognizes that the chief difficulty in the way of realizing the possibilities in public health improvement arises from the fact that the public has not yet caught up in understanding and practice with the knowledge and facts which science or experience has obtained for us.[11]

If appropriations for health work are not yet on a par with those for other departments of public service, it is because we have not yet made it sufficiently clear to the public that health is quite as important as, for example, education, or that we have not made clear the methods by means of which we can secure these benefits.

If preventable diseases still persist so largely it is because we have failed to impress the public sufficiently with the importance of their prevention or have failed to point out a practical procedure to secure their prevention.

If the cost of hospitals and institutions for the care of chronics and incurables is still mounting as a public burden, it is because we have not yet succeeded in getting sufficient understanding of the importance of: child guidance and mental hygiene, periodic health examinations (Dr. Glendening, notwithstanding),[12] and early, persistent treatment.

Health demonstrations have come into existence in response to the obvious necessity that the public must be further educated in the possibilities of preventive medicine and the fundamentals of personal hy-

giene; and that such education can best be accomplished by demonstrations; and because of the equally patent fact that health departments are largely without the means to undertake such educational work without financial assistance.

Funds for the demonstrations are essentially from private sources. In all instances financial assistance is qualified; that is to say, certain stipulations must be met by the community in which the demonstration is undertaken. Thus the demonstration work in rural sanitation, for which federal aid is requested through the U. S. Public Health Service, will not be granted unless the community agrees to pay at least one-half of the expense.[13] Aid from the Rockefeller Foundation "is conditioned upon substantial contributions from other sources," and is further qualified in that it is only for demonstration of innovation and improvement. The fund withdraws entirely from a project as soon as it has become self-directing and self-supporting.[14]

The same policies govern contributions from the Commonwealth Fund, the Milbank Memorial Fund, the Metropolitan Life Insurance Company, the American Child Health Association, and other agencies. In all instances development of service by and through local official agency is sought, so that the activities developed may become permanent.[15, 2, 16]

Initiation and support of demonstrations are further conditioned upon invitation by proper local official authorities and community representatives, and the local medical profession; and qualified by geographical location, local needs and facilities and assurance of coöperation.

The plans for different demonstrations have varied, according to the special interests of the contributing agency. Thus the demonstrations receiving aid from The American Child Health Association and the Commonwealth Fund center upon child welfare; others, like those in Framingham, Montreal, and Detroit, center upon tuberculosis, etc. The demonstrations receiving grants from The Milbank Memorial Fund follow a general health program, as do the rural health demonstrations receiving help through the U. S. Public Health Service.

It is of interest to note that in all of the demonstration fields where the program was conceived primarily as a specialized service, the work sooner or later broadened into a more or less general health program.

It is of interest also to consider the experience in the various demonstration areas as to the time required for the accomplishment of work undertaken. For obvious reasons the contributing agency cannot commit itself to a program of support for an indeterminate length of time. The general plan followed stipulates that the community in

which the demonstration is carried on will, within a certain number of years, take over such service as appears essential to its needs, for which the contributing agency primarily has advanced the necessary money.

In Framingham the original plan called for a 3-year program. However, the demonstration was prolonged for 7 years. The demonstrations carried on through the coöperation of the Commonwealth Fund, as well as those aided by the Milbank Memorial Fund, are planned on a 5-year time limit. The latter agency has, however, at the invitation of the communities in which it assists, considered favorably the advisability of extending the time limit.

In the foregoing has been briefly sketched the growth of health demonstrations, especially in the United States; the underlying thought in their development; the general policies, plans and period of their operation. There remains the all-important question—Are they worth while? No final and conclusive answer can be made to this question at this time. However, the following points may be made from a study of the reports of the various demonstrations available thus far:

1. The purpose of these health demonstrations—to advance public health education by demonstration—is unquestionably good.

2. The plans and policies of the demonstrations—to work only where wanted; to work through and not on a community; to have the local community share in the financial responsibility of undertakings and to withdraw as soon as the local project has become self-supporting and self-directing—are likewise sound.

3. Time limitation for demonstrations, necessary from the viewpoint of the contributing agencies, has had a tendency to force the development of progress in some demonstration areas, creating difficulties in administration.

4. A fixed program with specialized objectives is an evident advantage for the initiation of health demonstration work. It seems important, however, to keep the program elastic so that it can be shaped to suit special local needs and interests. Sooner or later all demonstrations broaden out into a general health program.

5. Growth of demonstrations indicates public approval. The request to continue demonstrations beyond the originally stipulated time agreement is especially suggestive of this conclusion.

6. The cost of demonstrations does not appear excessive, and has not so far exceeded $2.00 per capita anywhere. Whether this is adequate or not the future must determine. The public appears willing to pay for the service, and budgets for health work have been generally doubled over their original appropriation within the time of the demonstration.

7. The demonstrations have in all instances brought about an extension of health service which, with few exceptions, has been maintained in full or in part after the withdrawal of the contributing agency.

8. The educational effect of demonstrations can obviously never be fully measured. In many instances it has, however, resulted in such tangible evidence as the improvement of water supplies, sewage disposal, proper milk and food control, building of schools, noticeable changes in the dietetic habits of communities, the

formation of health clubs, health conferences and other measurable services in standard public health procedure.

9. The experience with preventable disease in various demonstration districts has shown quite general improvement over pre-demonstration periods. In some instances results appear quite striking. Obviously these records must be treated conservatively.

It would be overlooking a material point in the experience of health demonstrations if nothing were said concerning certain difficulties that have been encountered in some demonstration areas.

It is rather disappointing that these difficulties should have arisen from within the ranks of the medical profession. Fortunately, however, it would appear that most of these difficulties can be cleared by getting over to the medical profession a better understanding of the purposes and methods of demonstrations. It is significant that where the profession is best informed, the work of the demonstrations has had its strongest endorsement and support.

The explanation of the difficulties encountered perhaps lies in the fact that the health demonstration movement has addressed itself too exclusively to the public, and has taken it too much for granted that the rank and file of the medical profession has kept pace with the trend of time, which also in the field of medicine is shifting from a purely curative practice to one which places emphasis more and more on prevention.

The practitioner of medicine must adjust himself to this inevitable change of which health demonstrations are merely an expression.

As an editorial in the *Journal of the American Medical Association* aptly puts it, "Today medicine—and particularly preventive medicine—is the property of all mankind. A progressive physician must be aware of his relations to the civic and economic problems of the community and the nation."

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Modified Iodine-Pentoxide Method for Determination of Carbon Monoxide in Air and Blood*

MATHEW J. MARTINEK AND WILLIAM C. MARTI

Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

THE danger from carbon monoxide poisoning in the large centers of population is becoming increasingly great. There is scarcely an industrial activity in which this gas is not encountered. The use of coal gas, water gas, and devices in which coal, oil, gas and gasoline are burned may be and often is attended by a danger to health when there is imperfect combustion or faulty ventilation. Automobiles also are contributing materially to air pollution, not only with irritating fumes but also with the invisible, colorless and odorless carbon monoxide gas.

The recognized effect upon health of small amounts of carbon monoxide continuously inhaled has brought an insistent demand for highly sensitive laboratory methods of quantitatively estimating this gas in concentrations as low as 0.1 part per 10,000 in air, and also in the blood of exposed persons. To meet this need our experiments were undertaken.

The first part of the experiment was devoted to altering and modifying existing methods and apparatus in order to obtain a method which would be accurate for very low concentrations. Methods such as the Orsat,[1] Blood Colorimetric,[2] Blood Spectroscopic,[3] Blood Pyrotannic,[4] and others were tried out but, although having many advantages, were eventually discarded as not fulfilling our requirements.

The method finally selected was the iodine-pentoxide method as modified by Teague,[5] which depends on the oxidation of carbon monoxide to carbon dioxide by iodine-pentoxide, and the accurate determination of the liberated iodine. It is based on the following reaction:

$$I_2O_5 + 5CO \rightarrow I_2 + 5CO_2$$

The report of the New York State Bridge and Tunnel Commission[6] was used as a basis for the construction of our apparatus. However, we introduced several modifications to improve the accuracy of the

* Read before the Laboratory Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

method and the simplicity of its operation. The apparatus as assembled (see Figure I) consists of a series of absorbing towers arranged in the following order: *C*, concentrated sulphuric acid, to remove a portion of the moisture; *E*, concentrated sulphuric acid heated to 150° C. by means of an oil bath *F*, which absorbs heavy hydrocarbons, most of the gasoline, and methane; *G*, cold, concentrated sulphuric acid, to catch any of the fumes liberated from *E*; *H*, *I* and *J*,

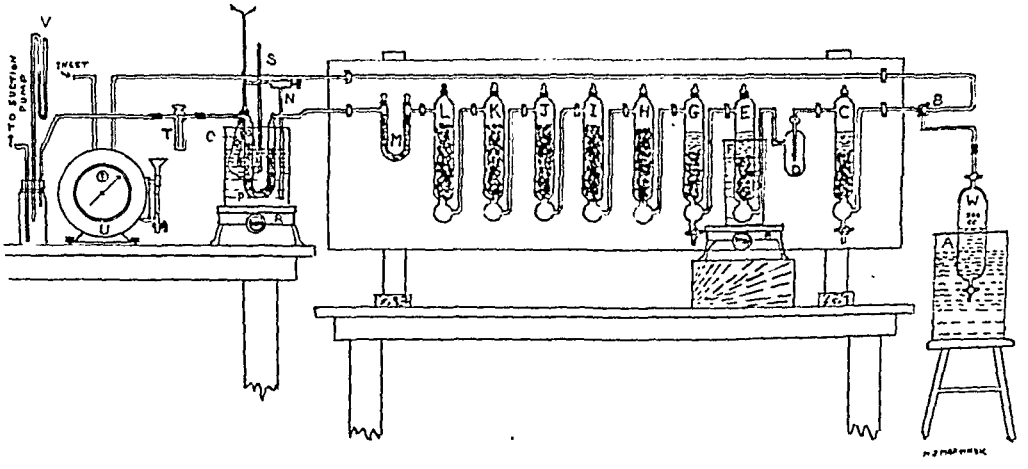


FIGURE I—APPARATUS FOR AIR ANALYSIS

activated charcoal, which removes the last traces of unburned gasoline and hydrogen; then a series of moisture absorbents consisting respectively of: soda-lime *K*, solid potassium hydroxide *L*, and dehydrite *M* (a mixture of magnesium perchlorate and trihydrate). These absorption towers are connected to a hard glass U-tube *O*, containing iodine-pentoxide, and immersed in a bath of oil *P*, kept constantly at 150° C. by means of a thermostat *N*, and electric light *Q* connected in series. All the towers are mounted on an upright board for stability and economy of space.

The liberated iodine is finally absorbed in a specially constructed absorption bulb *T*, containing 5 c.c. of 10 per cent potassium iodide. This bulb is in turn connected to a standard meter *U*, which registers the volume of gas flowing through the apparatus, and finally to a manometer *V*, which indicates variation in pressure of the gases flowing through the apparatus. The gas is drawn through the apparatus by means of a Bunsen vacuum pump. The inlet of the apparatus consists of a 3-way stopcock *B*, which allows either ordinary air or the sample of air to be tested to be drawn through the apparatus. Heating of the oil baths is done by means of electric stoves *R*.

Before any test can be made, the iodine-pentoxide must be heated to 215° C. for several hours, to remove any free iodine or moisture.

This process is called "seasoning." We continue this "seasoning" until practically no iodine is liberated.

The sample of gas to be analyzed is passed into the apparatus from a 500 c.c. Thoerner gas bottle *W*, by displacement with saturated salt solution, and the apparatus is then washed with 3½ liters of air. The washing requires about 45 minutes. The liberated iodine is then titrated with N/200 sodium thiosulphate solution, using a microburette.

The apparatus was tested by running several hundred duplicate samples containing known amounts of carbon monoxide, and the following are average results of a typical series of varying concentrations:

No. of Determinations	Carbon Monoxide (in parts per 10,000)		Deviation of Determined Findings from Computed parts per 10,000
	Computed	Determined	
7	9.75	9.67	−0.08
7	4.90	4.84	−0.06
5	1.00	0.95	−0.05
9	0.50	0.44	−0.06
7	0.20	0.15	−0.05

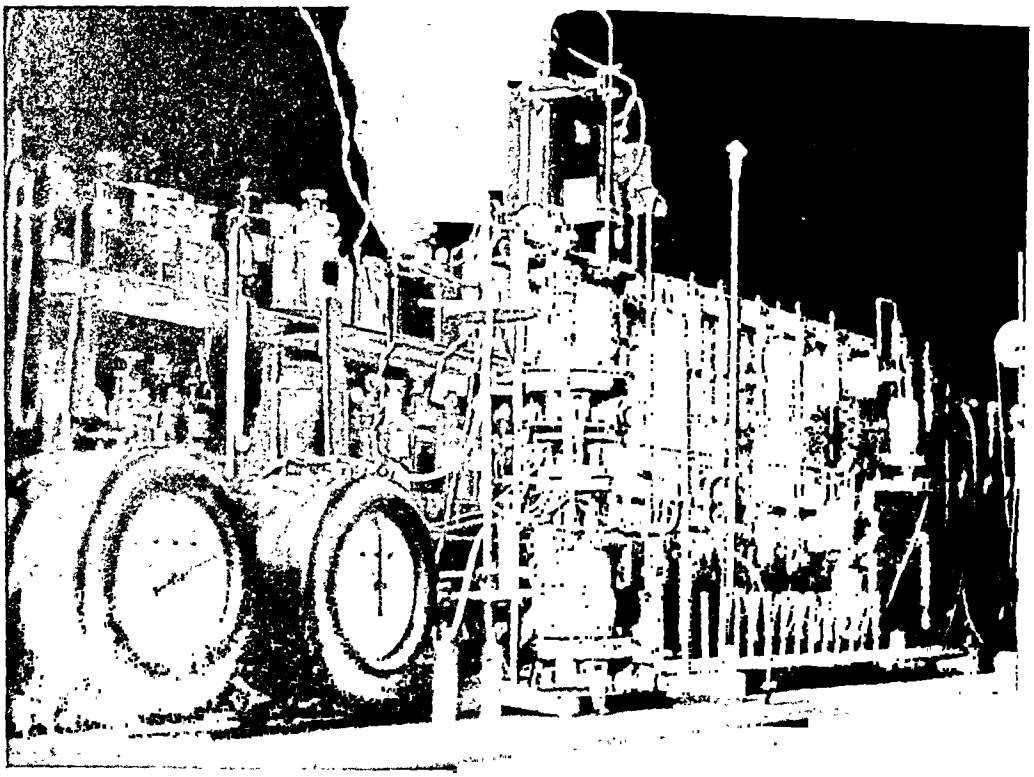
The percentage of error increased with the increase in dilution, although the average error was 0.06 parts per 10,000 for all concentrations. In the great majority of the determinations (95 per cent) the error was under 0.10 parts per 10,000, which we regard as the limit of accuracy of the method.

To determine the effect of gasoline, which is always present in automobile exhaust gases, in the determination of carbon monoxide with the apparatus, about 100 prepared samples were tested. Quantities of gasoline, ranging from 0.1 c.c. to 1 c.c., were added to the 500 c.c. sampling bottle containing the carbon monoxide, before the sample was passed through the apparatus. The following are the average results of a typical series of such analyses:

No. of Determinations	Carbon Monoxide (in parts per 10,000)		Deviation of Determined from Computed parts per 10,000
	Computed	Determined	
3	9.58	9.69	+0.11
3	0.94	0.95	+0.01

The results showed that gasoline in concentrations generally found in exhaust gases has no material effect on the determination of carbon monoxide with the apparatus. Unsaturated hydrocarbons were also effectively absorbed, as well as hydrogen in the very small amounts usually found in exhaust gases.

The following features of the apparatus as modified by us, both in construction and operation, should be noted:



DUPLICATE SET-UP FOR ROUTINE WORK

1. All connections on the apparatus are so made that the gases at no time come in contact with rubber. The various absorption bulbs are arranged in series, and those requiring the least replacement of absorbing material contain solid reagents, while those requiring frequent replacement contain liquid reagents, the latter bulbs being emptied by means of stopcocks in the lower end. This feature obviates dismantling of the apparatus whenever it becomes necessary to renew the reagents.

2. The absorption towers and attachments are mounted on an upright board, thus occupying a minimum of space. The main portion of the apparatus can also be moved easily without disturbing the connections.

3. By the introduction of the gas meters, we were able to insure equal volume of flow through the apparatus at all times, thus avoiding any great variations in the blank determinations.

4. To avoid discrepancies in results which may occur from changes in the temperature of the oilbath heating the iodine-pentoxide tubes, a thermo-regulator connected in series with an electric light bulb was placed in the bath.

5. Our absorption towers were designed or chosen with the purpose of obtaining the maximum absorption with the least amount of head to overcome.

6. "Dehydrite" (magnesium perchlorate, trihydrate—Smith) was found superior to phosphorus pentoxide as a drying agent, as the former does not clog and cause back pressure in the apparatus.

7. The absorption tower, containing the potassium iodide solution, was so constructed that a trap was unnecessary in case of back pressure.

8. The use of a micro-burette, having a capacity of 5 c.c. and accurately calibrated to 0.01 c.c., improves the accuracy of the method. In order to make

the delivery tip sufficiently small and the delivery at the same time accurate, a platinum hypodermic needle was ground to fit the tip of the burette, and the number of drops equivalent to 1.0 c.c. was accurately determined.

After the perfection of the above mentioned apparatus, we experimented on the determination of carbon monoxide in the blood of persons exposed to small concentrations of the gas, and devised the accessory apparatus shown in Figure II for that purpose.

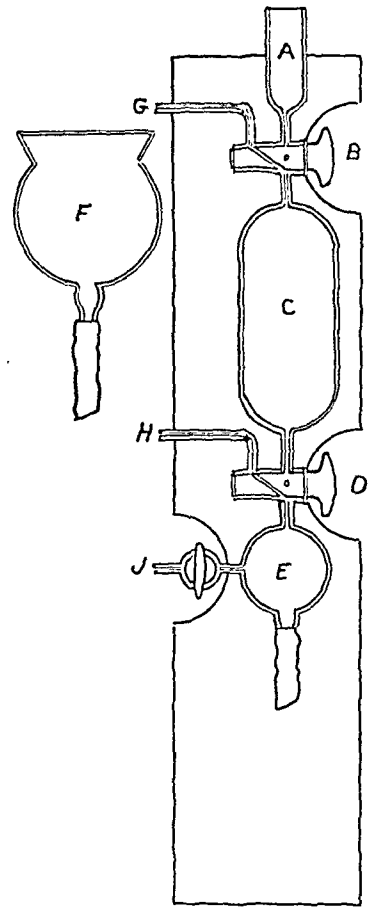


FIGURE II—ATTACHMENT FOR BLOOD ANALYSIS

The apparatus for analysis of blood is operated as follows: It is entirely filled, to stopcock *B*, with mercury by raising leveling bulb *F*, and opening stopcocks *B* and *D* straightway, keeping stopcock *J* closed. Stopcock *B* is then closed, and *F* lowered to produce a vacuum. Three c.c. of the oxalated blood under examination are pipetted into funnel *A* and are then carefully drawn into chamber *C* by slowly opening stopcock *B*. This is followed by 10 c.c. of boiled, distilled water to rinse the funnel, and then by 10 c.c. of a reagent,[7] made up of the ingredients given below.

Potassium ferricyanide	8.0 gm.
c.p. Lactic acid	4.0 c.c.
Saponin	3.0 gm.
Caprylic alcohol	3.0 c.c.
Water, Qs.	1,000.0 c.c.

This reagent liberates the gases from the blood very rapidly under reduced pressure. The apparatus is then shaken for 10 minutes by means of a motor attachment similar to that used with the Van Slyke apparatus.

Leveling bulb *F* is then lowered in order to cause all liquids in *C* to enter *E*, and stopcock *D* is then closed, care being taken that stopcock *B* is tightly closed. The liquids over the mercury are then ejected from the apparatus through *H* by turning stopcock *D* and raising *F* carefully, thus leaving *E* entirely filled with mercury. Then mercury is lowered in *E* until the level is below *J*. The connection *G* is next attached to the inlet of the modified carbon monoxide apparatus first described (Figure I), and *J* is connected to the outlet end

of the meter. The gases liberated from the blood, and held in chamber *C*, are now drawn through the apparatus by opening first stopcock *J*, then stopcock *D* straightway, and lastly stopcock *B* through *G*. The apparatus is washed out thoroughly with air, and a blank on a like volume of air is run.

By means of this apparatus we were able to determine carbon monoxide in blood concentrations as low as 0.003 c.c. of the gas per 3.0 c.c. of the blood, or a saturation of 0.5 per cent, which amount is well below the dosage producing physiological effects.

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DISCUSSION

FRED O. TONNEY, M. D.

Director of Laboratories and Research, Department of Health, Chicago, Ill.

AS civilization progresses, new material advances give rise to new health hazards, which are the consequence of changes in living conditions and environment. So it is with the unprecedented development of automobile transportation.

Health officers must be ever on the alert not only to meet the hazards of the present, but also to anticipate the hazards of the future. From the data of this paper and its companion paper read in the Engineering Section, embodying the results of a survey of street air in Chicago,[1] it becomes apparent that in the growing use of the gasoline motor we have to deal not only with a well known though perhaps minor hazard to life from carbon monoxide, but also with an ever impending and at times actual hazard to health, which is of even greater concern to us from the standpoint of numbers affected.

For this timely information on the public health dangers of carbon monoxide in street air, we are indebted primarily to the foresight of chemists who, within a few years, have taken the cruder analytical methods and refined them to an almost unbelievable degree of sensitiveness and precision. They now tell us the carbon monoxide content of air with accuracy down to less than 0.1 part per 10,000—a thing that appeared impossible a few years ago. To the engineers we are indebted for the practical application of these painstakingly evolved chemical methods.

Such problems as the aggregation of tall buildings affecting air movement, the ventilation of the lower levels of doubledecked streets, the peak of air pollution by rush hour motor traffic and, as a consequence of these, the necessity of safeguarding the health of the multitude of workers who must breathe this air hour after hour, day after day, and month after month—all these new problems, like the other older health problems, are in a fair way to be solved when they are once fully and thoughtfully recognized.

This particular problem of congested community life will be solved as others have been solved, not by regression, but by progression. It is unthinkable that, for health's sake, we may some day have to dispense with or restrict the use of so useful a tool as the gasoline automobile, for the sole reason that its combustion of fuel is incomplete and imperfect. The logical forward step toward the solution is to find ways of insuring complete combustion in the gasoline motor and to apply them as fully as possible, with the coördinated objectives of safeguarding health and conserving fuel.

The perfection of mechanical design, the use of chemical catalytic agents to accelerate combustion and the possible means to dispose of products of incomplete combustion, are some of the subjects for intensive study. I feel that we of the Laboratory and Engineering Sections are indeed fortunate in having had such an opportunity as these papers present to secure definite information on the actual conditions as they exist today and on the present and potential health hazards inherent in this modern transportation development.

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EDITORIAL SECTION

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HYGIENE IN MEDICAL SCHOOLS

EVEN if it were not so freely admitted, the discussions which have gone on, and are still taking place, over medical education and the arrangement of the curriculum would prove that there is something wrong in our present methods of teaching. There are few, perhaps none, who are entirely satisfied with the present state of affairs, and there is an earnest effort to correct obvious faults. The whole matter may be summed up by saying that medicine has become such an enormous subject, while life is so urgent and so short, that it is impossible to give the ideal amount of time for proper education in the profession. New discoveries are piling up daily. The professor in whose branch a particular discovery lies must add it to the subjects taught, although his time is already insufficient for the matter in hand. Specialism is rampant, and each specialty demands its particular school, or at least a course. The difficulties are obvious. Further lengthening of the time required for the degree of Doctor of Medicine is almost out of the question. The obvious task is to apportion properly the time among the necessary and fundamental subjects.

Some schools are trying to meet the difficulty by giving fewer hours to required subjects and allowing more time for electives. While this has certain advantages, the wisdom of too great liberality is extremely doubtful. Medicine has become a business rather than a profession. Many of the high ideals of the fathers of medicine have gone down before the fire of commercialism, and the average student is not in a position to select judiciously his elective subjects. He will be swayed by the success of certain older men, including perhaps his father, or by the popularity of one or the other professor. The experience of laboratory men shows the difficulty of obtaining graduates in medicine for laboratory work. The emoluments of practice are so much greater

than can be hoped for from laboratory work that students are turning away from the latter.

In a journal like ours, we do not propose to discuss the entire medical curriculum. We are concerned in preventive medicine and hygiene. The Association of American Medical Colleges requires 54 hours as a minimum in these subjects. The average of 17 leading colleges is 47 hours. A recent schedule[1] devotes only 12 hours to hygiene and sanitation, an hour percentage of 0.4 as compared to 3 to 4 recommended by the Association of American Medical Colleges. It is explained that this small allotment of time is due to the inclusion of most of the instruction in preventive medicine in the schedule of the medical department. The same schedule drops bacteriology to 88 hours. The makers of this schedule are said to believe "that clinical medicine should be the backbone of the curriculum," therefore more than one-third of the required hours are given to that branch, which includes psychiatry, pediatrics, etc.

It has often been pointed out that public health is a profession requiring special training. Without a desire to criticise, it may be said that the average medical teacher has not had special training in bacteriology, preventive medicine, hygiene or sanitation, and is not in a position to teach these subjects to students. It is perfectly natural that the clinician should be interested in clinical medicine, with the various and rapidly multiplying methods of diagnosis and treatment. It is perfectly true that such a professor, while teaching typhoid fever —the example used in the article referred to—may tell how to disinfect the stools and urine, and may give the common sources of infection and a glimpse at the epidemiology of the disease; but it is extremely unlikely that he will treat the subject adequately, for lack of time if for no other reason, and his interests lie chiefly in the clinical side of the disease.

It is perfectly obvious that the good clinician is practicing preventive medicine, whether or not he recognizes it. With each cured case, a focus of infection is destroyed. This should never be lost sight of by those who go perhaps too much to extremes in pushing hygiene. On the other hand, one cannot imagine the average clinical professor teaching much about bacteriology, vital statistics, the physics of ventilation, lighting and heating, the purification of water supplies or the many other subjects which come properly under the head of hygiene. It is, of course, possible to develop a new type of medical teacher. The evolution is going on at present, but it is a fact that these subjects are not being generally or thoroughly taught by professors of medicine.

Anyone who reviews the papers presented before the National Board of Medical Examiners is necessarily convinced of the fact that the teaching of hygiene is extremely deficient. Students from some of our leading universities do not even know the meaning of maritime quarantine. They cannot give the insect-borne diseases met with in the United States, much less tell the difference between Aëdes aegypti and Anopheles. No one who has been a teacher will judge teachers too severely by the showing of students, but surely fundamental facts of importance should stick if properly implanted.

Instead of decreasing the number of hours given to preventive medicine and its various branches, they should be increased, and the importance of prevention should be magnified rather than subordinated to treatment and cure. Recognizing fully the wonderful advances in medicine and surgery, and the appeal which the relief of suffering and restoration to health always carry, it can still be said that prevention is more important than cure. Too long has medicine been regarded as the "healing art." It is time for a readjustment of the emphasis. The medical schools which fail to read the signs of the times will find their graduates more and more replaced by those of non-medical schools which lay stress on biology, sanitary engineering and kindred subjects.

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ACCIDENTS

PREVENTIVE medicine has been concerned too exclusively with the prevention of disease, the great majority of its devotees still regarding that function as the chief, if not the only province of their profession. Some of the old dictionaries had in their definition of medicine "the remedying, as far as possible, the results of accident and violence." The speed of modern life has forced us to recognize the prevention of accidents as a part of our calling, though a casual survey of books on hygiene and preventive medicine indicates that only those interested in industrial hygiene have given the subject the attention which it deserves.

The 1928 report of the National Safety Council[1] arrests one's attention. During 1927, more than 95,000 deaths occurred by accident. If the same rate of increase holds for 1928, approximately 100,000 lives will have been lost. While the year showed a low general death rate, no improvement for accidents is evident. From 1911 to 1928, there was a total decrease in the death rate from accidents of

7.2 per cent, all of which, however, occurred prior to 1921, since which year the death rate has steadily increased. The actual number of deaths per year has increased 20 per cent. The most striking item is that deaths from automobile accidents have increased 1050 per cent during the same period. It is pleasing to note the great improvement in deaths from railway and street railway accidents—37 per cent in one case, and 44 per cent in the other. As might be expected, a large number of automobile accidents occur among children, most of them in the 5–9 year period. This rate is exceeded only in the longer 15–24 year period, by approximately 3 per cent. Defects in the vehicle, such as poor brakes, improper lighting, etc., played a comparatively small part in the total number of accidents, there being only 4,969 cases reported in approximately 200,000 vehicles. Intoxication and physical defects were reported in 3,163 cases, 90 per cent of these being the result of intoxication. As far as the responsibility of the driver of the car goes, the greatest number of accidents occurred through violation of the rules of right of way. Excessive speed, driving on the wrong side of the road, failing to signal and cutting in, come next in order as given. As far as pedestrians injured are concerned, crossing at intersections without a signal was the chief cause of accidents, crossing between intersections coming next, and playing in the street third.

A more recent report from the City of New York,[2] while not so detailed in character, shows that highway accidents lead as the cause of violent deaths—1,306 out of 5,902.

The figures taken from these two reports have been selected because, for the most part, they represent the more easily preventable causes of accidents. The railroads and street car lines have adopted very widely the "Safety First" slogan. It is recognized that the great increase in automobile traffic has had a marked influence in decreasing the number of passengers on railways and street cars, especially for the short hauls, but there is little doubt that care of equipment and instructions to operatives have also played a part. It seems time for those interested in hygiene and public health to take a more active part in the education of the public in the prevention of accidents, and for the influence of the vast body of health workers to be exercised, not only for the making of laws, but for the provision of officers to enforce such laws.

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1. *Public Safety Series, No. 17,* 108 East Ohio Street, Chicago, Ill.
2. *Weekly Bull.,* Dec. 1, 1928.

NOISE

WE live in a world which is noisy and daily becoming noisier. Mechanical inventions of every kind are replacing hand labor, and most of them produce noises of varying degrees of intensity. Even the air is now inhabited by planes. The speed of the times requires work both at night and on Sundays.

With the exception of hospitals and schools and the so-called quiet zones, the average person has probably accepted these new noises as inevitable. During the past two years the matter of noise has gotten into the medical journals of several countries. The physician interested in the treatment of insane or neurotic individuals is perhaps more concerned than the average doctor, though the good effects of rest and sleep are well recognized in the treatment of all diseases.

In England the matter has recently been brought to a focus by a memorandum submitted to the Minister of Health by the British Medical Association.[1] While it is particularly desirable that the usual hours of sleep—say from 10 p.m. to 6 a.m.—should be kept quiet, it is obvious that many persons work at night and rest during the day. Healthy persons seem capable of adapting themselves to noises, though this costs something in the amount of energy which must necessarily be expended in inhibiting the undesirable stimuli. Where a noise is rhythmic and uniform in quality, pitch and intensity, the average person apparently bears it with little injury, but noises which are irregular in any of these qualities do serious injury.

No argument is needed to emphasize the importance of rest and quiet sleep. Health can be maintained only when these can be obtained. Those who are sick need all their strength for recovery. Neither the sick nor the well can afford to have their necessary rest disturbed, especially where the noises are of such an unnecessary and aggravating character as to produce emotions of reaction such as anger and irritation. In approximately 75 per cent of cases of mental breakdown, loss of sleep is either a symptom, or causes an aggravation of the basic difficulty, and, on the other hand, production of sleep is recognized as a means of prevention and even cure.[2]

Among the disturbing factors which stand out prominently are the horns of automobiles, motorcycles, exhausts without mufflers, trucks without pneumatic tires—especially those handling milk cans—engines blowing off steam, cars with flat wheels, and in towns, street cars with flat wheels and loose trucks. Conditions differ according to the locality, but everyone will recognize some of these noises wherever he may be.

Those who are "nervous" are doubtless prone to exaggerate the

intensity and the bad effects of noises, but there are probably few people, even in the smaller towns or along the highways of the country, who will not admit the unnecessary disturbances both during the hours normally allotted to rest and those devoted to labor.

The Minister of Health, who is a layman, gave a sympathetic hearing to the joint deputation from the British Medical Association and the People's League of Health, pointing out, however, that some definition of what constituted noise must be agreed upon, and suggesting further that studies should be made in factories, such as are already being carried out by the Industrial Fatigue Research Board. People certainly vary tremendously in their reaction to stimuli of various sorts. One must remember the reply of the artillery officer at a concert who was asked if he was fond of music. His reply was, "Yes, I like noise of any kind."

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1. *Brit. M. J.*, Supplement, Nov. 10, 1928, p. 1267.
2. *Brit. M. J.*, Dec. 8, 1928, p. 1053.

ASSOCIATION NEWS

HEALTH SURVEY OF HONOLULU

The Committee on Administrative Practice of the A. P. H. A. has been asked to make a survey of public health activities in the City and County of Honolulu. This study, which is being sponsored by the United Welfare Fund of Honolulu, has the endorsement of the U. S. Public Health Service, the local board of health, the medical profession, hospitals of the city, the local chamber of commerce, and the most important voluntary agencies engaged in public health and welfare work. A special survey committee with wide representation has been appointed and is already actively engaged in gathering information and data which will be of assistance to the surveyor. Prof. Ira V. Hiscock will carry on the field work for the Committee on Administrative Practice, and will leave for Honolulu the latter part of May. Prof. Hiscock will have the benefit of consultant service from experts on certain phases of health work which are included in the survey.

DEATH OF MR. ROSSITER

William Sydney Rossiter, for many years President of the Rumford Press, Concord, N. H., died January 23, at his home, after an illness of a few days' duration.

Mr. Rossiter published the JOURNAL for several years and took an interest in its development even after it had been transferred to another publishing house. He was an ex-president of the American Statistical Association.

MAURICE M. SEYMOUR DIES

The Association announces with regret the death of Maurice McDonald Seymour, M.D.C.M., D.P.H., LL.D., formerly Deputy Minister of Health of the Province of Saskatchewan and a vice-president of the American Public Health Association. Dr. Seymour was president of the Conference of State and Provincial Health Authorities of North America in 1926 and was active in public health work in Canada for more than 20 years.

The following item has been prepared for the readers of the JOURNAL by F. C. Middleton, M.D., Acting Deputy Minister of Health of Saskatchewan:

Dr. Seymour was automatically superannuated in November, 1927, in accordance with the provisions of the Superannuation Act of Saskatchewan. However, the Government requested him to remain as Advisor to the Government on Public Health matters, there being just at that time several matters of importance to be dealt with by the department, one of which was a request made by the United Farmers' Organization of the Province that a travelling diagnostic clinic be established under the auspices of the department. It was then also that the time was considered ripe for introducing the full-time health district system into Saskatchewan, and Dr. Seymour had been promoting this scheme for the past few months previous to his death. His death, which was due to acute indigestion and chronic myocarditis, was very sudden, as he was sick only twenty-four hours. He had been in the office on Tuesday and passed away on Thursday morning, January 17. Dr. Seymour was an ardent worker and the fruits of his labors will be long felt not only in this province but throughout the Dominion and North America.

MICHIGAN PUBLIC HEALTH WORKERS MEET FOR EIGHTH YEAR

The Eighth Annual Public Health Conference of Michigan was held at Lansing, Mich., January 9–11, under direction of the Michigan State Department of Health and the Michigan Public Health Association with a registration of 286.

The following officers were elected:

President, Carl E. Buck, Dr.P.H.; *Vice-President,* Annette M. Fox, R.N.; *Secretary-Treasurer,* W. J. V. Deacon, M.D.; *Board of Directors,* Prof. John Sundwall, Don M. Griswold, M.D., Theodore Werle, W. D. Henderson, M.D., Louis Dorpat, M.D., and Mrs. J. K. Pettengill.

Guy L. Kiefer, M.D., was elected representative on the Governing Council of the A. P. H. A.

James W. Wallace, M.D., Associate Field Director for the Committee on Administrative Practice, A. P. H. A., represented the Association and addressed the conference.

SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION OFFICERS

At the annual meeting of the Southern California Public Health Association held January 30, in Los Angeles, Calif., the following officers were elected for the year: *President,* Warren F. Fox, M.D., Health Officer, Pasadena; *First Vice-President,* W. B. Wells, M.D., Health Officer, Riverside County; *Second Vice-President,* A. M. Lesem, M.D., Health Officer, San Diego; *Secretary-Treasurer,* C. W. Arthur, City Bacteriologist, Pasadena; *Executive Committee,* Warren F. Fox, M.D., Health Officer, Pasadena; J. L. Pomeroy, M.D., County Health Officer, Los Angeles; C. W. Arthur, City Bacteriologist, Pasadena; Sven Lokrantz, M.D., Medical Director, Los Angeles City Schools, Los Angeles; H. A. Young, Chief Sanitary Inspector, County Health Department, Los Angeles; L. Simpson, R.N., Director of Nurses, County Health Department, Los Angeles; W. T. Knowlton, Sanitary Engineer, Los Angeles; G. E. McDonald, M.D., Health Officer, Long Beach; K. H. Sutherland, M.D., Health Officer, Orange County.

REPORT OF THE COMMITTEE ON THE STATUS OF MATERNAL AND INFANT MORTALITY

Anyone wishing to obtain the report of the Committee on the Status of Maternal and Infant Mortality of the Child Hygiene Section of the American Public Health Association may borrow the original report from the Association. The complete report has not been published in any of the journals because of the large amount of statistical material contained therein.

DEATH OF DR. WILLIAM H. DAVIS

William H. Davis, M.D., Chief Statistician for Vital Statistics in the Bureau of the Census, who died on January 8, was an outstanding figure in the field of vital statistics. He was a graduate of Harvard University and of the Harvard Medical School. After studying in Europe, he decided to devote himself to vital statistics work, and became, in 1908, Deputy Health Commissioner and Vital Statistician of the City of Boston. In 1916, he was appointed to the position in the Bureau of the Census left vacant by Cressy L. Wilbur, M.D. He filled this position according to the best traditions left by his predecessors, Dr. Wilbur and William A. King, both truly great men. Due to Dr. Davis's work in the Bureau and his active connection with the world-wide movement for better vital statistics, he became one of the foremost authorities in his chosen profession.

In the Bureau of the Census, his energy was largely directed toward the completion of the registration areas for births and deaths; and second only to their sorrow at the loss of the man himself is the regret of his professional associates that Dr. Davis did not live to see the day (near at hand) when success will crown his long campaign for country-wide registration of these vital data. He enlisted in this campaign the active assistance of the American Public Health Association, which appointed its

Committee to Aid Completion of the Registration Area.

He was actively interested in the scientific classification of diseases for purposes of mortality and morbidity statistics. In this he was a recognized authority throughout the world. He was an active member of the Committee on Accuracy of Certified Causes of Death (Vital Statistics Section of the A. P. H. A.). This committee, largely through Dr. Davis's efforts, was instrumental in bringing about important improvements in the International List of Causes of Death. In 1920, he was one of the United States delegates to, and Vice Chairman of the International Conference, at Paris, for the revision of this classification. In 1927, he again went to Europe to consult with foreign nosologists concerning problems to be considered by the next International Conference on revision of the classification. In 1925, on invitation of the League of Nations, he joined a tour of medical statisticians, with the object of bringing about closer agreement in international statistical practice.

Dr. Davis was a prominent figure in the A. P. H. A. He was a Vice President in 1923, Chairman of the Vital Statistics Section in 1919–1920, and, year after year, served as chairman of important committees.

One outstanding contribution was the Bureau of the Census *Manual of Joint Causes of Death,* published in 1925. This gives the best method of disposing of one of the most troublesome phases of codifying causes of death. Dr. Davis deserves special credit, also, for his improvements in the Standard Certificates of Births and Deaths.

While with the Boston Health Department, he wrote two valuable pamphlets: *The Relation of the Foreign Population to the Mortality Rates for Boston* and *The Statistical Comparison of the Mortality of Breast-Fed and Bottle-Fed Infants.*

The Bureau of the Census mortality reports were improved in several respects while Dr. Davis was Chief Statistician. Especially noteworthy were his tables showing contributory as well as primary causes of death. During his administration, much valuable information was made public when it was of *current* interest. This was appreciated by public health workers and the press, which used Dr. Davis's announcements in news dispatches and editorials.

Personally, he was a modest, kind-hearted gentleman. The whole-hearted sympathy of all who knew him goes out to his widow and children. He was liked and respected by his colleagues, who recognized his zeal for his chosen profession and his fine, companionable personality.

NEW MEMBERS

James M. Adams, M.D., Baton Rouge, La., Refinery Physician, Standard Oil Company of Louisiana

William S. Applegate, Neptune, N. J., Health Officer and Deputy Registrar Vital Statistics

Roy T. Barker, New York, N. Y., Director of Health and Safety, Western Electric Company (Assoc.)

M. F. Barnes, V.M.D., Harrisburg, Pa., Director of Laboratory, Bureau of Animal Industry

James M. Beeler, M.D., Spartanburg, S. C., County Health Officer

Marjorie T. Bellows, B.A., Albany, N. Y., Statistician, Division of Vital Statistics, State Department of Health

B. D. Blackwelder, M.D., Natchez, Miss., Director Adams County Health Department

Sidney W. Bohls, M.D., Austin, Tex., Director of Laboratory, State Health Department

Beatrice Hall, B.S., Cambridge, Mass., Student in Biology and Public Health, Massachusetts Institute of Technology

Charles F. Hayes, M.D., Fort Worth, Tex., Director of Health, Public Schools

Clyde C. Hays, Waco, Tex., Chemist and Bacteriologist, Health Department

Lee S. Huizenga, M.D., C.P.H., Grand Rapids,

Mich., Student, Department of Public Health, Yale Graduate School (Assoc.)

Mattie C. Jackson, R.N., Port Arthur, Tex., School Nurse

Lawrence H. James, Ph.D., Washington, D. C., Food Bacteriologist, U. S. Department of Agriculture

Adam G. Kading, Long Beach, Calif., Chairman, Grand Jury Public Health Committee, Los Angeles County (Assoc.)

Nadina R. Kavinoky, M.D., Pasadena, Calif., Lecturer at Mothers' Conferences, Los Angeles County Health Department

P. Martin Keller, M.D., Glendale, Calif., Deputy Health Officer, Los Angeles County Health Department

O. J. Muegge, B.S., Madison, Wis., Assistant Sanitary Engineer, State Board of Health

Timothy F. Murphy, M.D., Washington, D. C., Chief, Division of Vital Statistics, Bureau of the Census

E. H. Parfitt, M.S., LaFayette, Ind., Milk Inspector, Dairy Department, Purdue University

Stanley J. Peltier, M.S., Mt. Clemons, Mich., Research Bacteriologist

Robert A. Phair, B.S., Allendale, N. J., Vice-President, Board of Health

Russell I. Prentiss, Lexington, Mass., Milk and Health Inspector

Myrtle F. Roberson, R.N., Greensboro, N. C., Supervising Nurse, Greensboro Nursing Council

Edward S. Rogers, Trenton, N. J., Sanitary Inspector

Robert D. Roller, Jr., M.D., Charleston, W. Va., Chief Medical Inspector, Public Schools

Paul L. Skoog, Inglewood, Calif., Los Angeles County Health Department

Robert R. Spears, A.B., Altoona, Pa., Bacteriologist, Pennsylvania Railroad Laboratory

Ellen S. Stadtmuller, M.D., San Francisco, Calif., Chief, Bureau of Child Hygiene, State Department of Public Health

Margaret H. Tracy, A.B., Sante Fe, N. M., Field Representative, Committee for the Completion of the Registration Area by 1930, American Public Health Association

Leon Wasserman, Ph.G., Philadelphia, Pa., Assistant Bacteriologist, Bureau of Water, Belmont Laboratories

Myron Weiss, A.B., New York, N. Y., Associate Editor, *Time* (Assoc.)

Harry von Loesecke, S.B., Arlington, Mass., Research Chemist, United Fruit Co., Boston, Mass.

DECEASED MEMBERS

George T. Johnson, M.D., Terre Haute, Ind. Elected member 1926

Harry Rand, M.D., Chicago, Ill. Elected member 1923

A. M. Burt, M.D., Ballston Lake, N. Y. Elected member 1926

Horatio Z. Silver, M.D., Eaton, O. Elected member 1926

Isaac W. Brewer, M.D., Bath, N. Y. Elected member 1915—Fellow 1922

Thomas P. Walsh, M.D., Middletown, Conn. Elected member 1915

Edward A. Woods, Pittsburgh, Pa. Elected member 1927

Dr. R. G. Burns, Pittsburgh, Pa. Elected member 1915—Fellow 1922

Nannie L. Winn, M.D., Nashville, Tenn. Elected member 1927

Richard A. Gantz, Muncie, Ind. Elected member 1926

Carl Speer, Jr., M.S., Baltimore, Md. Elected member 1926

Marinus L. Holm, M.D., Lansing, Mich. Elected member 1914

C. G. McLaughlin, M.D., Dunkirk, O. Elected member 1927

George A. Dickinson, Port Hope, Ont. Elected member 1919

Edward G. Folsom, Mt. Clemons, Mich. Elected member 1928

E. C. Schroeder, M.D., Bethesda, Md. Elected member 1920

Joseph Goldberger, M.D., Washington, D. C. Elected member 1909—Fellow 1922

William H. Davis, M.D., Washington, D. C. Elected member 1919—Fellow 1923

EDITOR'S APOLOGY

Proof of the discussions on pp. 28–30 of the January, 1929, JOURNAL, following the article, "Mobilizing Mutual Benefit Associations for Health," was *not* submitted to the discussants before publication.

The statements were printed verbatim from the notes.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Conference on Influenza, January 10, 1929—The following is a report of one of the three committees of the Conference.*

REPORT OF COMMITTEE ON EPIDEMIOLOGY

The features which have distinguished influenza in its typical pandemic outbreaks, such as those of 1918 and 1889–90, are:

1. A great increase in the prevalence of illness of which the usual symptoms are: fever, of more or less sudden onset, of moderately high range and of only a few days' duration; aching of the body and limbs; inflammation of the upper respiratory passages, and marked prostration. In its manner of spread this disease has the characteristics of a highly contagious infection, transmitted directly from person to person.

2. Coincident increase in the prevalence of pneumonia, developing apparently as a complication of a certain proportion of the influenza cases.

3. A rise in the general mortality rate, due largely to increase in deaths certified as influenza or pneumonia. These deaths characteristically show an age distribution different from that of normal times, in that the proportion of young adults is increased.

4. In any given locality, the epidemic develops and runs its course rapidly, so that its duration, even in a large city, is a matter of not more than 5 to 10 weeks.

5. The tendency is to rapid and wide extension, different communities being attacked in such quick succession that the spread across a continent requires only a few weeks, and where the disease becomes pandemic it travels around the world within 3 to 6 months.

The epidemics which show the full development of all these features, including world-wide prevalence, are rather rare events, recurring at intervals which usually have exceeded 20 years. However, at much more frequent intervals we have minor epidemics, similar in general character, but differing from the typical picture in some respects, notably in lower prevalence, less severe clinical type, slighter effect on mortality, and less extensive area of spread. The exact relationship which these bear to true pandemic influenza is still a matter for investigation rather than fixed opinion; but the more distinct of the minor epidemics are generally accepted as true influenza of modified virulence and intensity. Since 1919 at least two such outbreaks have occurred in the United States, one in 1920 and one in 1926, with some more doubtful epidemics in other years.

The data available at this time for judging the nature, extent and severity of the present epidemic are: clinical accounts of the cases seen in communities already attacked; official morbidity reports, which are admittedly incomplete and uneven, but have nevertheless a certain significance; and, for the large cities listed in the *Weekly Health Index*, weekly reports of deaths from all causes, and from influenza and pneumonia.

All this evidence agrees in indicating the existence of a definite epidemic of influenza. It seems to have developed first in the vicinity of San Francisco, early in November. Since that time it has extended, with characteristic rapidity and in fairly regular sequence, until it has now become demonstrable in all sections of the United States except the northeastern states.

The epidemic is already on the decline in those western cities which were first affected; and has apparently reached its peak in some middle western cities, but in the east seems not yet to have reached

* Report of the Committee on Preventive Measures appeared in the JOURNAL for February, 1929, p. 205.

its full development. The effect on mortality has not approximated that caused by the pandemic of 1918, and has been less than in the epidemic of 1920, but more severe than at any time since the latter date.

For the statistical and epidemiological study of the epidemic we recommend:

1. That the U. S. Public Health Service continue and extend its activity in the collection and compilation of morbidity and mortality statistics, to afford both a current and a permanent record of the epidemic.

2. That the U. S. Public Health Service undertake special surveys of morbidity in a sufficient number of localities to give a more exact picture of the prevalence and epidemiology of the disease.

3. That state and local health authorities, the military services, and institutions, in addition to collecting their usual records, undertake such statistical and field studies as circumstances will permit, and that they be especially on the alert to take advantage of any opportunities which may be presented for unusually instructive epidemiological observations.

4. We would also call attention to the need for extensive and careful clinical studies, particularly such as will give accurate descriptions of unselected cases, including the milder types of doubtful diagnosis.

In addition to the general subject, two specific questions have been referred to this committee.

First: Is it desirable that influenza be included in the list of notifiable diseases? We believe that it should be so included, at least to the extent of simple numerical statements.

Second: Should an official clinical definition of influenza be adopted by this Conference for the guidance of physicians in differentiating influenza from other respiratory disorders to the end that morbidity reports should be more uniformly comparable? We believe that this is not advisable.

WILLIAM H. WELCH
WILLIAM H. HOWELL
MATTHIAS NICOLL, JR.
W. G. SMILLIE
EDGAR SYDENSTRICKER
W. F. DRAPER
THOMAS F. PARRAN
W. H. FROST

Immunization in Scarlet Fever—A group of 9,780 school children of known skin test were selected for observation for a period of 3 years. During this time 182 contracted scarlet fever. In accordance with the result of the skin test the children have been divided into five groups. There were 3,424 who gave a negative skin test, of whom 16 developed scarlet fever, giving an incidence rate of 4.7 per 1,000. There were 2,289 in the group with (±) skin test (diameter of reddened area 0.5–1.0 cm.), and of these, 21 contracted scarlet fever, giving an incidence rate of 9.2 per 1,000. In the group with (+) skin test (1.0–1.5 cm.) there were 2,099 children, of whom 48 contracted scarlet fever, giving an incidence rate of 22.9 per 1,000. There were 1,528 children with a (++) skin test (1.5–2.5 cm.). In this group 73 contracted scarlet fever, giving an incidence rate of 47.5 per 1,000. There were 440 in the group with a (+++) skin test (2.5 cm. and larger). Among this group 24 cases of scarlet fever developed, giving an incidence rate of 54.5 per 1,000. These figures show that the more intensively positive the test, the higher is the incidence rate of scarlet fever. If contracted by negative and slightly positive reactors, the disease is generally mild, especially so far as the rash is concerned.

Among 1,825 children completely immunized against scarlet fever with a dosage of from 30,000 to 50,000 skin test doses, 1 case of scarlet fever developed, giving an incidence rate of 0.6. Among 636 incompletely immunized, 11 cases developed, with an incidence rate of 17.3. Among 832 known immunized children 40 cases developed, with an incidence rate of 48.1.—George Moriwaki, Correlation between the Skin Test and Active Immunization in Scarlet Fever, *J. Prev. Med.*, 3: 13 (Jan.), 1929.

LABORATORY

C. C. YOUNG

A NEW MICRO SLIDE HOLDER

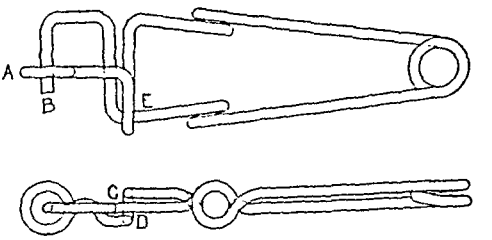
PHILIP L. VARNEY

Washington University, St. Louis, Mo.

OF THE numerous slide holders obtainable for use in staining procedures, none are constructed to grip the slide in a manner to prevent effectually the overflow and spilling of the stain, due to capillarity, when the slide is flooded, as in acid-fast staining. The slide holder described here was designed to prevent such repeatedly experienced accidents. The slide may be held very rigidly by the use of such a device.

Figures I and II illustrate the construction of the slide holder, which should be made of phosphor-bronze wire 2.5 mm. in diameter. The most convenient length for ordinary staining purposes is 15 cm., and the width at the widest point 3.5 cm. It is so constructed that by compressing the handle of the holder the tip (B) is forced upward, leaving a gap between it and the platform or ring (A), in which the slide is placed. When the pressure on the handle is removed, the slide is gripped and held firmly.

Side movement of the tip (B) is prevented by means of the guards (C) and (D), between which the wire (E) slides. These guard wires must be of such a length that with the micro slide in place (E) will still be between the guards, thus effectually preventing any trace of sideward movement and the consequent dropping of the slide.



FIGURES I AND II

The micro slide may be held with any desired tension, by removing (E) from between its guard wires and bending the spring backward or forward in the desired direction, thus increasing or decreasing the tension. Any size slide may be held without danger of its turning or of the stain overflowing even when the slide is flooded to the extreme edge.

CASES OF DYSENTERY IN NEW YORK STATE ATTRIBUTED TO B. DYSENTERIAE SONNE

RUTH GILBERT, M. D., AND M. B. COLEMAN

Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

CASES of dysentery attributed to the lactose fermenting bacillus described by Sonne[1] have seldom been reported in this country, although dysentery due to infection with this organism has been recognized in Australia,

Europe, England, and Scotland, where a milk-borne epidemic occurred in 1926.[2] The symptoms described have usually been less severe than those following a *B. dysenteriae* Flexner infection, but recently two fatal cases[3, 4] have been reported in England.

B. dysenteriae Sonne corresponds to the Flexner and Mt. Desert types in morphology and in the reaction produced in triple-sugar agar. The biochemical characteristics, however, show certain marked differences. Lactose is fermented slowly; the formation of appreciable amounts of acid in medium containing this carbohydrate may be delayed 10 days or longer in the case of some freshly isolated strains. Mannitol is fermented; maltose and saccharose may or may not be, and when they are, the reaction is slow. Acid is produced slowly in milk. Indol is not formed. In polyvalent dysentery immune serum prepared with the nonlactose fermenting strains, cultures of the Sonne dysentery bacillus are usually agglutinated only in low dilutions. Even in homologous serums they may be inagglutinable when freshly isolated, but, after being transferred daily for from 1 to 2 weeks, a specific reaction is obtained. Agglutination of the culture in patients' serums is believed by Sonne and others to be of definite significance.

Within a few months, 12 strains of this organism, 8 of which were isolated either in the branch laboratory or in county laboratories, have been identified. All were obtained from fecal specimens from patients reported to have more or less severe symptoms of dysentery, bloody stools being noted in 4 cases. No deaths have as yet been reported. Unusually dilute suspensions of the cultures absorb the agglutinative properties of a serum prepared with a strain of *B. dysenteriae* Sonne obtained from the American Type-Culture Collection.

In only 1 instance were any other organisms of diagnostic significance found. *B. typhosus* was isolated from a specimen of feces received from one patient 2 days before the specimen was received in which *B. dysenteriae* Sonne was found. The clinical manifestations were typical of typhoid fever. It seems probable either that this was a double infection or that the patient was a carrier of the dysentery bacillus, since other patients in the same hospital were suffering from dysentery and *B. dysenteriae* Sonne was isolated from their stools.

Four of the 12 cases described occurred in two state hospitals, and 5 in a city during an epidemic of enteric disease attributed to a polluted water supply. The remaining 3 were in widely separated counties. This distribution indicates that infection with *B. dysenteriae* Sonne may be more prevalent than has previously been supposed.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Principal Causes of Death in 1927—The Department of Commerce announced that 1,236,949 deaths occurred in 1927 within the death registration area of continental United States, representing a death rate of 11.4 per 1,000 population, the lowest since 1900. The principal decreases in death rates were for pneumonia (all forms) from 102.5 per 100,000 population in 1926 to 80.5 in 1927, for influenza from 40.7 to 22.6, tuberculosis (all forms) from 87.1 to 80.8, diarrhea and enteritis (under 2 years) from 27.0 to 21.6, nephritis from 98.3 to 92.5, measles from 8.2 to 4.1, and diseases of the heart from 199.1 to 195.7. An increase is shown in the death rates from automobile accidents from 17.9 per 100,000 population in 1926 to 19.5 in 1927. Other causes of death that showed increased death rates for 1927 were diphtheria, malaria, cancer and other malignant tumors, and suicides.—U. S. Dept. of Commerce, *Press Release,* Dec. 21, 1928.

Preliminary Report on Marriage and Divorce for the United States, 1927—There were 1,200,694 marriages performed in the United States during the year 1927 as compared with 1,202,574 in 1926. These figures represent a decrease of 1,880 marriages, or about 0.2 per cent. The number of marriages per 1,000 population was 10.12 in 1927 as against 10.27 in 1926. During 1927 there were 192,037 divorces granted, as compared with 180,853 in 1926. This is an increase of 11,184, or 6.2 per cent. There were 4,252 marriages annulled in 1927, as compared with 3,825 in 1926. While the net decrease in the number of marriages performed in the country as a whole was 0.2 per cent, the relative change in the different states ranged from a decrease of 25.4 per cent in Florida to an increase of 95.3 per cent in Nevada. The number of marriages per 1,000 population in 1927 ranged from 4.7 in Delaware and 5.8 in Wisconsin to 31.0 in Nevada and 16.6 in Mississippi. These figures may be compared with those of 1926, being 4.6 per 1,000 population for Delaware, 5.8 for Wisconsin, 15.9 for Nevada and 16.0 for Mississippi. The number of divorces showed a range of increase from 1.1 per cent in Oregon to 52.1 per cent in the District of Columbia and 91.3 per cent in Nevada. The decreases in divorces ranged from 35.3 per cent in Vermont to 1.9 in Missouri. The figures for Vermont and Nevada are due to changes in the divorce laws, effective in 1927. The number of divorces per 1,000 population was 25.2 for Nevada in 1927 as compared with 13.2 in 1926. In the District of Columbia there were 0.27 divorces per 1,000 population as compared with 0.18 in 1926.—U. S. Department of Commerce, *Press Summary,* Dec. 17, 1928.

Mortality Figures of the Willard Parker Hospital—In 1922, 4,409 cases were treated at Willard Parker Hospital. These resulted in 737 deaths, a mortality of 16.7 per cent. In 1924 the general mortality for 3,320 cases was 10.9 per cent; and in 1927 for 3,323 cases, it was 7.3 per cent. Between 1922 and 1927 the general mortality was reduced 56.3 per cent. Between the years 1922 and 1927, the diphtheria mortality at Willard Parker Hospital

fell from 18.1 to 9.0 per cent, a reduction of 50.3 per cent. Improvement in the treatment of laryngeal diphtheria "croups" by suction was responsible in a large measure for the reduction of the diphtheria death rate. In 1922, 14.2 per cent of the cases treated were intubated, and 53.8 per cent of these died. In 1927, 4.5 per cent of the cases treated in the hospital were intubated, and 16.7 per cent died. There were 1,158 cases of measles in 1922, and 22.5 per cent of these died. In 1925, a non-epidemic year, 6.2 per cent of 660 cases died, and in 1927, 9.1 per cent of 220 cases died. During 1922 there were 895 cases of scarlet fever treated which had a mortality of 8.4 per cent, as against 936 cases treated in 1927 which had a mortality of 2.4 per cent. The reduction of the scarlet fever mortality was largely influenced by the use of serum in the treatment of severe cases. —Shirley W. Wynne, *New York State J. Med.*, 29: 12–13 (Jan. 1), 1929.

The Health of Gibraltar—During 1927 the corrected death rate of Gibraltar was 20.3 per 1,000 population, while the crude rate was 17.3. The birth rate was 22.5 per 1,000, and the infant mortality rate was 99 deaths per 1,000 live births. There were 16 deaths from cancer, 1 from diphtheria, 9 from influenza, 27 from pneumonia and 30 from tuberculosis. The death rate from pulmonary tuberculosis was high, being 1.3 per 1,000 population.—*Med. Off.*, 40: 223 (Nov. 24), 1928.

VITAL STATISTICS FOR 1928

New York, N. Y.—The Health Department of New York reported that there were 77,677 deaths from all causes during 1928. This gives a death rate of 12.9 per 1,000 population, as compared with 12.2, the average rate for the previous 5 years. The total number of births during 1928 was 126,332, a decrease of 2,556 from 1927, and 3,758 from 1926. Deaths among infants totalled 8,279, giving a rate of 66 infant deaths per 1,000 births. During the year there were 641 deaths from diphtheria, 17,079 from heart disease, 4,611 from pulmonary tuberculosis, 9,951 from pneumonia, 891 from influenza, 7,677 from cancer, and 514 deaths from meningitis.—*New York Times*, Jan. 2, 1929; *New York Sun*, Jan. 2, 1929.

Newark, N. J.—Newark's birth rate for 1928 is the lowest on record in the city. There were 9,886 births during the year, giving the low rate of 20.9 births per 1,000 population. The estimated number of deaths under 1 year of age is 620 for the year, giving an infant mortality rate of 63 per 1,000 births. The estimated number of deaths for the year was 5,670, giving a general mortality rate of 11.5 per 1,000 population. This is a slight rise over 1927 when the rate was 10.9 per 1,000. Typhoid fever showed the greatest reduction of deaths, with the low death rate of 1.05 per 100,000 population. The nearest approach to this record was in 1925 when the rate was 1.1 per 100,000. Scarlet fever had a death rate of 1.5 as compared with 2.6 for 1927; whooping cough had a rate of 4.4 for 1928, and 6.6 in 1927; heart disease had a rate of 208.9 in 1928, and 217.9 for 1927. The greatest increase was shown by measles, with a mortality rate of 10.1 per 100,000 for the year as compared with a rate of 0.7 in 1927. Another marked increase was shown by pneumonia with a mortality rate of 129.7 as compared with 103.8 for 1927.—*Newark News*, Dec. 29, 1928.

Hoboken, N. J.—According to the registrar of vital statistics there were 1,159 births in Hoboken for 1928, as compared with 1,225 for 1927. The birth rate in 1928 was 16.6 per 1,000 population as compared with 17.9 for 1927. There were 645 deaths from all causes in 1928, giving a death rate of 9.2 per 1,000 population, as compared

with 651 deaths with a death rate of 9.3 in 1927. In both 1928 and 1927 the greatest number of deaths occurred between the ages of 50 and 60 years. There were 116 deaths from pneumonia in 1928, as against 101 in 1927. Thirty-five deaths were caused by tuberculosis in 1928, as compared with 37 in 1927. There were 35 deaths from cancer in 1928 as against 45 for the preceding year.—*Jersey Observer,* Jersey City, N. J., Jan. 16, 1929.

Milwaukee, Wis.—The 1928 death rate for Milwaukee was 10.7 per 1,000 population. The infant mortality rate was 68 deaths per 1,000 live births. There were 1,710 cases and 10 deaths from scarlet fever, as compared with 1,362 cases and 7 deaths in 1927. Whooping cough had 1,943 cases and 24 deaths compared with 1,114 cases and 16 deaths the previous year. Influenza showed a marked increase, with 77 deaths compared with 21 in 1927, and pneumonia showed 532 deaths, compared with 491 in 1927. Typhoid fever with 16 cases and 4 deaths showed the lowest typhoid record in the history of the city. Diphtheria showed an improvement, with 349 cases and 30 deaths, compared with 694 cases and 49 deaths in 1927. Tuberculosis showed a decrease for 1928 with 263 deaths compared with 292 in 1927.—*Milwaukee Journal,* Dec. 31, 1928.

San Francisco, Calif.—Up to December 26 there were 7,928 births in San Francisco for the year 1928. During 1927 there were 8,344 births. The number of deaths from all causes has increased from 7,826 in 1927 to 8,151 up to December 26, 1928.—*San Francisco Bulletin,* Dec. 31, 1928.

Omaha, Neb.—There were 2,748 deaths from all causes in Omaha during 1928, giving a death rate of 12.3 per 1,000 population. The total deaths from all causes in 1927 were 2,687. There was a rate of 20.0 births per 1,000 population, and a rate of 48 infant deaths per 1,000 live births. Pneumonia with a rate of 162.9 deaths per 100,000 population was the leading cause of mortality. Tuberculosis followed with a rate of 44.0; diphtheria with 5.8; typhoid fever 2.7; whooping cough 0.9; erysipelas 0.9; and scarlet fever with a death rate of 0.4 per 100,000 population. There were 312 cases of diphtheria, 37 of measles, 247 of scarlet fever, 101 of smallpox, 59 of mumps, 50 of whooping cough, 21 of typhoid fever, and 3 cases of erysipelas. —*World Herald,* Jan. 1, 1929.

Butte, Mont.—Deaths exceeded births in Butte during 1928. There were 1,001 deaths and 880 births for the year. During 1927 there were 879 deaths and 912 births.—*Montana Standard,* Jan. 10, 1929.

Regina, Sask.—The total number of deaths in the city of Regina for 1928 was 527, as against 395 in 1927. There were 1,360 births, as against 1,215 for the previous year. There were no serious epidemics in the city during 1928. —*Regina Post,* Jan. 8, 1929.

Toronto, Ont.—There were 6,883 deaths from all causes in Toronto during 1928, as compared with 6,285 for 1927. There were 607 deaths from pneumonia for 1928, as compared with 430 for 1927. Influenza combined with pneumonia resulted in 246 deaths for 1928, as compared with 109 for 1927.—*Daily Times,* Moncton, N. B., Jan. 3, 1929.

Quebec, Que.—Mortality figures in the city of Quebec for 1926, 1927 and 11 months of 1928 showed evidence of progress especially in the combating of contagious diseases. The death rates per 100,000 population from all causes for 1926, 1927 and 1928 respectively were 195.9, 120.0 and 64.1 for Beauce County; 160.3, 163.9 and 111.0 for Lake St. John County; 125.2, 86.7 and 55.1 for St. Hyacinthe County; and 89.9, 91.8 and 62.8 for Joliette County. —*Montreal Star,* Jan. 15, 1929.

Diphtheria Deaths in Massachusetts, 1927—During 1927 there were 4,750 diphtheria cases and 268 deaths reported in Massachusetts. The case fatality rate of 5.6 per cent is the lowest on record in the state. The mortality rate of 6.3 per 100,000 population is the second lowest on record, only being surpassed by the rate of 5.9 in 1926. A study of 117 diphtheria deaths occurring during 1927 was made, based upon a personal investigation by the State District Health Officers. Among the 117 deaths, 47.8 per cent were under 5 years of age, and 34.0 per cent were between the ages of 5 and 10 years. The largest percentage of deaths, 13.7, occurred among those aged 2 years. A physician was called at some time during the course of the illness in each of the 117 cases investigated. In a total of 94 cases, the economic status of 22 was good. Among 18.2 per cent of those of good economic condition the physician was called on the first day of illness, among 27.2 per cent the physician was called on the second day, and among 22.7 per cent, on the third day. The economic status of 42 of the 94 cases was fair. Among 7.1 per cent of these a physician was called on the first day of illness, among 11.9 on the second day, and among 33.4 on the third day of illness. Thirty of the cases had a poor economic status. Thirteen and three-tenths per cent of this class called a physician on the first day of illness, 10.0 per cent on the second day, 6.7 per cent on the third day, and 20.0 per cent on the fourth day of illness. Fifty-seven per cent of 112 patients were hospitalized. In 6 of 106 cases, the physician was said to have failed to make a primary clinical diagnosis of diphtheria. Antitoxin was administered in 114 of the 117 cases studied. The largest individual dose administered was 100,000 units; the smallest, 500 units. The largest total amount given any one case was 200,000 units; the smallest, 2,000 units. In 73.0 per cent of 96 cases, the physician administered antitoxin on the day of his first visit. In 11.5 per cent of the cases, antitoxin was administered 1 day after the first visit of the physician. The Schick test had never been performed on 102 of the 117 cases studied. Information is lacking for the remaining 15 cases.—Edward A. Lane, *New England J. Med.*, 199: 939–944 (Nov. 8), 1928.

Health in Iceland—During 1926 Iceland had a death rate of 11.1 per 1,000 population, and a birth rate of 26.1. The infant mortality rate was 49 per 1,000 live births. Three outbreaks of typhoid fever, which were traced to milk, caused 175 cases and 13 deaths. The outbreaks were overcome by isolation and preventive vaccinations. Seventy-one cases of diphtheria, mostly of a mild type, caused 2 deaths. The death rate from pneumonia was about 1 per 1,000 population, and the rate from bronchitis was 0.09 per 1,000. There were 3,115 cases of influenza, as against 941 in 1925. The death rate from tuberculosis was very high, about 2 per 1,000 population, and shows no tendency to decline. Tuberculosis of the lungs is more frequent in women than in men. About 20 per cent of the tuberculosis deaths were due to the meningeal form of the disease. There were 4 deaths from puerperal causes, a rate of 1.5 per 1,000 births. Thirty-two cases of syphilis were reported, including 14 foreigners, and 236 cases of gonorrhea, including 41 foreigners. The number of lepers showed a decrease. In 1921 there were 63, and in 1926 there were 49.

Vaccination has been legally enforced since 1910. In 1926, 3,060 children were vaccinated for the first time, and 2,215, aged 12 to 13, were revaccinated. —*Lancet*, 215: 828 (Oct. 20), 1928.

Heart Disease in Children—This study is based on the statistical analysis of case histories of 500 children, from infancy to 22 years of age, observed in a clinic under the same medical supervision during the 10-year period 1916–1927. Congenital heart defects occurred in 11.2 per cent of the total cases. Five and four-tenths per cent of the patients had definite organic diseases of unknown etiology. Twenty-five children, classified as harboring possible heart disease, had negative histories, slight heart enlargement and persistent systolic murmur. Of these children, 20 retained the same physical signs over the period of observation. Rheumatic infection occurred in 395, or 79 per cent of the 500 cases.

The average age of onset in 413 cases of rheumatic infection was 7.3 years. Recurrence of infection occurred in 85 per cent of those with initial infection at ages 3 to 5 and in 63 per cent of those infected after age 10. In 67.8 per cent of the rheumatic cases the duration of the disease had been from 1 to 5 years, in 21.8 per cent from 6 to 9 years, and in 10.2 per cent from 10 to 16 years.

A history of measles was present in 53.7 per cent of the cases, occurring between the ages of 3 and 5 years, in 36.9 per cent. Scarlet fever occurred in 10.2 per cent of the children. In 38.2 per cent of the cases it occurred between the ages 6 and 9 years. Polyarthritis occurred from 1 to 6 times in 65.8 per cent of 272 rheumatic children. Growing and joint pains occurred in 67 per cent of the 413 rheumatic children and were the first manifestations of infection in 26.6 per cent of the children. In 23 per cent of the cases the pains preceded polyarthritis, and in 10.9 per cent were followed by acute carditis. Forty-four and five-tenths per cent of the children gave a history of acute rheumatic carditis, or presented an attack while under observation. Heart involvement was exhibited in 79.5 per cent of the cases. On final examination 49.8 per cent of the rheumatic cases showed slight heart enlargement, 30.6 per cent moderate, and 17.6 per cent showed marked enlargement. Twelve per cent of the rheumatic children died, 22 per cent of the deaths occurring within 1 year of the onset of the infection. The most common age at death was between 11 and 14 years.—M. Wilson, C. Lingg and G. Croxford, Statistical Studies Bearing on Problems in the Classification of Heart Disease, *Am. Heart J.*, 4: 164–196 (Dec.), 1928.

Vital Statistics of Vienna, 1927—The population of Vienna for 1927 was 1,866,147, or 29 per cent of that for the whole republic. The total number of births in Vienna was 21,337 as compared with 24,064 in 1926. There were 26,379 deaths from all causes for 1927, and 25,378 for 1926. Infant deaths numbered 1,749, as contrasted with 1,889 in 1926. There were for the year 1927, 3,818 deaths from tuberculosis, and 3,882 for 1926; 2,308 deaths from pneumonia, and 2,386 for 1926; 198 deaths from diphtheria, and 99 for 1926; 76 deaths from scarlet fever, and 41 for 1926; 133 deaths from measles, and 9 for 1926; 33 deaths from typhoid fever, and 41 for 1926; 85 deaths from puerperal sepsis, and 37 for 1926.—Marriages, Births and Deaths in Vienna in 1927, *J. A. M. A.*, 92: 247 (Jan. 19), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Progress Report of the Committee on Milk Supply *—Last year the Committee on Milk Supply submitted to the section a tentative draft of standard pasteurization plant requirements based upon the U. S. Public Health Service Standard Milk Control Ordinance and Code.† These requirements were printed as a supplement to the May, 1928, issue of the *American Journal of Public Health and The Nation's Health*, with the statement that the committee would welcome constructive criticism on the report for its guidance.

The committee has carefully reviewed the suggestions offered, and submits certain amendments for its 1928 report. Some of the more important of these amendments are:

1. Means for preventing contaminated condensation on the headers of milk coolers from entering the milk
2. The elimination of cloth strainers after pasteurization
3. A requirement relating to the finish of walls and ceilings
4. More rigid fly exclusion requirements
5. More specific requirements for milk pump materials
6. An item admitting consideration by state health departments of new methods of pasteurization demonstrated to be of at least equal efficiency
7. A requirement forbidding transportation of milk between pasteurization and bottling
8. The inclusion of new and detailed requirements for thermometers used in pasteurization process control, as formulated by a conference of the U. S. Public Health Service, the U. S. Bureau of Standards, the U. S. Department of Agriculture, and representatives of the principal American Instrument Manufacturers (held in April, 1928)
9. A requirement that the temperature shown by the indicating thermometers and the recording thermometer charts continuously throughout the holding period must be at least the temperature which the definition of pasteurization requires the thermometers to show

The committee wishes to repeat its invitation to the members of the section and of the Association to submit suggestions during the coming year.

Your committee further wishes to advise that the above report has been considered, and agreed upon jointly with the Committee on Milk Sanitation of the Conference of State Sanitary Engineers.

Control of Malaria and Mosquito Breeding at the Marine Barracks, Quantico, Va., during the Year 1927 —This is a summary of the work done in the control of malaria and mosquito breeding at the Marine Barracks, Quantico, Va., during the year 1927, with a brief description of the personnel employed, their duties, material used with cost, and methods of control employed.

As a result of his studies the author concludes that with the use of airplanes: (1) 33 per cent Paris green in an inert dust is the most satisfactory strength under all wind conditions; (2) 1 pound of Paris green per acre is the proper unit; (3) material cost is approximately 70 cents per acre per season.

To show how effective has been the control the author cites that in 1922 the malaria admission rate was 28.26 per 100 and 0 in 1927.—W. M. Garton, *U. S. Nav. M. Bull.*, 26, 3: 747–754 (July), 1928. Abstr. O. C. Hopkins.

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* Presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

† This ordinance and code will be revised and printed by the U. S. Public Health Service in the near future.

Sanitary Engineering Aspects of Shellfish Pollution—This article gives a historical sketch of the relationship between oysters and public health. The author further discusses successively the biology of shellfish, the problem of pollution, both by domestic and industrial wastes, and specific Chesapeake Bay problems. Domestic sewage is dangerous from the standpoint of infecting the oyster, and if present in sufficient quantities destroys the oyster by virtual depletion of oxygen. Certain industrial wastes, such as cannery wastes, destroy oysters in the same way, while other industrial wastes, such as oil and tannery wastes, destroy oysters by virtue of toxicity.

Oysters may be contaminated and infected by growing in polluted waters and by improper handling. The floating of oysters for "fattening" is frowned upon by most authorities.

This article also contains a report of a survey by the Maryland Department of Health in the Chesapeake Bay problem, together with the laboratory findings.—Carl Speer, Jr., *Bulletin*, Maryland State Dept. of Health, 1, 3: 16–57 (Apr.), 1928. Abstr. A. H. Wieters.

An Outbreak of Infectious Diarrhea on Board the U. S. S. Melville, Attributed to Contamination from Gatun Lake, Canal Zone—At the time the U. S. S. Melville was in transit through the Panama Canal from Balboa, Canal Zone, to Colon, Panama, in March, 1927, about 6,000 gallons of water from Gatun Lake were taken on board for use in the boilers and stored in the ship's tanks after distillation. The cloudy appearance and unpleasant taste of the water attracted attention, so that samples of the water were collected and cultures made which indicated a heavy pollution of the water with *B. coli*. At the same time a number of the crew developed symptoms of mild enteritis.

Following the isolation of *B. coli* from the fresh water supply of the ship and the appearance of acute cases of enteritis among the crew, the water was pumped overboard and all tanks cleaned. They were then filled with freshly distilled water and disinfected by the addition of a solution of chlorinated lime. After this procedure no other cases of enteritis developed at the time. No water was taken on board during the return trip, so that water in tank No. A2, to which a later outbreak of acute enteritis was attributed, must have been overlooked when the other tanks were emptied, cleaned and disinfected.

On June 30, a junior dentist on board became ill with symptoms of severe gastroenteritis. On July 12 and 13, a number of patients were admitted to the sick list.

Cultures were made from the fresh fruits, vegetables, the scuttle butt and each individual tank. Water from the scuttle butt was found to be heavily contaminated with *B. coli*, and water from tank No. A2 gave a growth of a Gram-negative, motile bacillus later identified as *Bacillus fecalis alcaligines*. As a result of the investigation to determine how the contamination of the water in tank No. A2 had taken place it is believed either that water from Gatun Lake found its way into this tank through an open valve, or that infected water was delivered by the ship's evaporators to the tanks while in Gatun Lake.—Dallas G. Sutton, *U. S. Nav. M. Bull.*, 26, 3: 727–732 (July), 1928. Abstr. O. C. Hopkins.

Phenol Pollution of Public Water Supplies in the Middle West—This article discusses in some detail the development of control measures in connection with the pollution of public water supplies by phenol wastes from by-product coke plants. Mention is first made of the pollution of the water

supply of McKeesport, Pa., where the city secured a permanent injunction in 1918 against the Clairton By-Product Coke Plant of the Carnegie Steel Company to prohibit the discharge of their wastes into the stream. The company promptly developed a method of utilization of the waste in quenching the coke. Approximately $1,000,000 was spent by the company to eliminate this nuisance. Mention is also made of the interstate conferences arranged by the Surgeon General of the U. S. Public Health Service on May 18, 1923, January 24, 1924, and at Pittsburgh, Pa., on April 14, 1925. On November 17, 1924, an interstate stream conservation agreement was entered into by the states of Ohio, Pennsylvania, and West Virginia. Since this time the states of Kentucky, New York, Maryland, Illinois, Indiana, and Tennessee have joined the agreement, which provides for a coöperative program to control the pollution, and to notify the various plants of accidents or "spills."

Sources of phenol from by-product coke plants are given as follows:

Waste	Per cent phenol in plant waste	Approximate lbs. phenol per ton of coal carbonized
Ammonia still ...	70 to 80	0.3 to 0.5
Final cooling water	20 to 25	0.02 to 0.08
Benzol plant wastes	2 to 5	certain taste producing light oils
Gas condensate waste	Variable	certain taste producing light oils

Three methods of phenol elimination are mentioned: coke quenching, extraction of the phenol, and biological absorption. Objections to the quenching process include discoloration of the coke by lime deposited from the ammonia still wastes, disagreeable phenol odors, and deterioration of metallic equipment in the vicinity of the quenching tower by chloride from the lime waste, estimated at $200,000 annually at one plant with 10 quenching towers.

The extraction process was first developed at the National Tube Company, Lorain, O., in 1924, with a recovery of 76 per cent of the phenol. Later, plants were installed at the Iroquois Gas Corporation, Buffalo, N. Y., in 1925; at the Hudson Valley Coke Corporation, Troy, N. Y., in 1926; and at the Domestic Coke Corporation, Fairmont, W. Va., in 1927. These plants have developed an efficiency of 97 per cent. The cost at Fairmont was $25,000 for 1,000 tons coal daily capacity, and at Troy, $60,000 for 3,750 tons coal daily capacity. It is stated that the operation is self-sustaining. After tests at Rochester, N. Y., gas plant wastes were received in the public sewers with no deleterious effects to the Imhoff tanks. Rather detailed information is then given regarding the recovery installations at other places.

The conclusion contains an application of the data to the Sanitary District of Chicago, with certain recommendations.—Herman N. Bundesen, *Water Works*, 67, 6: 240–246 (June), 1928. Abstr. C. M. Baker.

Effect of Certain Illinois Waters on Lead—The preparation of this article was brought about by an investigation of a case of sickness in Champaign, Ill., which was diagnosed as lead poisoning. An analysis of the water which the patient had been drinking showed 0.08 p.p.m. of lead present.

The opinions of various authorities on the allowable limits of lead in water are cited. There are some data on the important factors causing the solution of lead as well as a short résumé on the analytical determination of lead. There are also tables showing compiled data on lead in water and a discussion of the effect of Illinois waters on lead. The

article is concluded with some authoritative data on prevention of lead corrosion. A bibliography is given on the subject.—O. W. Rees and A. L. Elder, *J. Am. Water Works A.*, 19, 6: 714–724 (June), 1928. Abstr. A. L. Dopmeyer.

Anopheles Density Index in Malaria Research and Control Work—The author calls attention to the value in any malaria investigation of the anopheles density index and gives directions as to the proper method of obtaining such index. In the vicinity of the field station of the Bureau of Entomology at Mound, La., the numbers of anopheles found under the houses of tenants on cotton plantations afford a good basis for determining density indices. The author illustrates by a series of charts and tables which exhibit the anopheline density indices of several plantations near Mound for different months of the year and for various years. A remarkable fall in the density of the region is recorded for the three years following 1923, a diminution due to droughts. The highest monthly index occurs in July. The flood of 1926 destroyed much of the aquatic vegetation in the lakes near Mound, and it may be some years before the normal production of anopheles is reëstablished there.—W. V. King, *South. M. J.*, 21, 9: 763–767 (Sept.), 1928.

Dissolved Iron and Manganese in Stored Water at Kernersville—This valuable contribution to the limited literature of manganese and iron removal reviews unusual problems developed at Kernersville, N. C., when a new filtration plant designed to treat a typical turbid water of a flowing stream was placed in operation to treat the same water after storage in a shallow reservoir containing large quantities of organic matter. Storage of this water led to a marked change in its quality, leading to the solution of manganese and iron from mineral deposits at the site and to a large increase in the color of the water. Experiments conducted at the plant indicate that aeration of the water failed to precipitate the iron and manganese, probably due to the large organic content.

Pre-chlorination of the water, however, led to the precipitation of the iron and manganese, but the organic color remained unchanged. Addition of lime to the raw water produced excellent flocculation of the iron and manganese, but no change in the organic color. Subsequent coagulation with alum, however, resulted in a reduction of the color. Experiments were duplicated on a plant scale by the addition of lime to the raw water entering the mixing basin. The dose of lime was determined by the maintenance of a faintly caustic reaction to phenolphthalein. The formation of the iron hydroxide was extremely rapid, allowing the alum solution to be added about half way down the mixing chamber. The alum dose was adjusted to maintain the optimum pH for color coagulation. The sedimentation of the floc, however, was slow, so that the settled water was more turbid than desirable, thus requiring frequent washing of the filters and the use of large volumes of wash water.

The above situation indicates the great desirability of thoroughly studying the quality of a raw water to be treated before the final plans for water purification plants are completed, in order that the plant may be provided with the necessary auxiliary equipment and for special treatment when such is necessary.—W. H. Weir, *J. N. C. Section Am. Water Works A.*, 5, 1: 119–126, 1927. Abstr. C. R. Cox.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

The Biochemical Reaction of Lead in the Body—The article reviews the theories and findings concerning the distribution and form of lead in the body, and of equilibrium between its soluble, or toxic diphosphate form, and its insoluble, or non-toxic triphosphate form. Since lead is in the blood, it comes in contact with all of the body tissues and this accounts for its multiple symptoms, which are usually grouped by the systems involved; the blood, the gastrointestinal tract, the nervous system (both central and peripheral), the skeletal system (both muscles and joints), the cardio-vascular system, the urinary system, the reproductive system (the germ cells).—May R. Mayers, *Indust. Hyg. Bull.*, New York State Dept. of Labor, 5, 7: 26–28 (Jan.), 1929.

Standards for Workmen's Compensation Laws—The proposed standards concern: I. The scale of compensation, including the matter of medical attendance; waiting period; compensation for total disability and for partial disability and for death, the latter including funeral expenses; compensation for the widow or widower or children or other relatives, or alien non-resident dependents, including the maximum and minimum compensation for death; and the commutation of periodical compensation payments. II. The employments to be included. III. The injuries to be included, taking into consideration occupational diseases. (Occupational diseases are now compensated in California, Connecticut, Hawaii, Massachusetts, North Dakota, the Philippines, Wisconsin, under the three federal laws, and to a limited extent in Illinois, Minnesota, New Jersey, New York, Ohio and Porto Rico.) IV. Other remedies than those provided for by the Compensation Act. V. Security for the payment of compensation awards. VI. Organization of the accident board. VII. Procedure for settlement of compensation claims. VIII. Reports of accidents. IX. Rehabilitation.—Committee on Workmen's Compensation, American Association for Labor Legislation, *Special Bulletin*, Revised to Jan. 1, 1929 (131 East 23d Street, New York, N. Y.).

The Problem of Industrial Health—The factory worker "goes stale" because of the monotony of his work, and the executive, because of (mental) strain. Physical examinations show about the same disabilities in both. Six chief causes of death—diseases of the heart and circulation, tuberculosis, cancer, apoplexy, kidney disease and diabetes—constitute nearly one-half of the 1,219,019 annual deaths in the 40 to 50 million "gainfully employed" in the country. These chronic diseases represent "silent sickness," because during the greater part of their duration no obvious disability is shown. Dr. Charles H. Mayo states that 86 per cent of all deaths are due to infections, and the same chronic infections exist in the worker as in other members of society. No adjustment of working hours or operations will meet "silent sickness" and its fundamental control lies in periodic health examinations, which the Metropolitan and Guardian Life Insurance Companies have shown will decrease mortality from 18 to 23 per cent (charts accompany).

Not only the man on the sick list, but the man who is one-half, one-quarter, or one-tenth sick must be considered. Disabilities are liabilities which have a cumulative effect. Any program which permits the man over 40 to be considered a physical and economic liability is unsound, while a thorough-going program of prevention, joined up to a mutual benefit association, would save enough lives in industry to offset the need for foreign labor. The worker's best investment of his own time, interest and some of his money is in his health. A reasonable coöperative plan is all that is needed.—Eugene L. Fisk, *Law and Labor,* X, 9: 196–200 (Sept.), 1928.

The Health of the Wage-earner—Industry must solve the cost of sickness in workers, or state legislatures will soon do so to the increased cost of goods. The Life Extension Institute states that the cost of preventable sickness and death among the gainfully employed in this country amounts to $1,800,000,000 annually, which represents half of the total disability. The answer is periodic health examinations. The Metropolitan Life Insurance Company states that there has been a reduction of 18 per cent in mortality, and the Guardian Life Insurance Company places it at 23 per cent, as the result of such examinations, while at some ages the reduction has been 50 per cent. Spending $100 a year on a machine to keep it in good condition, to be operated by a man who is only 50 per cent fit, is poor economy. The expense of health supervision should amount to 1½ per cent of the pay roll. This cost should be divided 50–50 with employes and the fund handled by a mutual benefit association which invests in a group life insurance policy. It should also provide two-thirds pay for 26 weeks and a competent physical examination annually. If properly run, such a plan will lay up from 20 to 40 per cent of its income, which can be spent for numerous accessory needs. The writer cites examples of benefits to employes in his own construction company "because we have a plan that is working along the right lines."—Harold A. Ley, *Law and Labor,* X, 9: 189–194 (Sept.), 1928.

Lead Poisoning from Lead Piped Water Supplies—Most lead poisoning is attributed to certain occupations. The Industrial Clinic of the Massachusetts General Hospital found almost 11 per cent of lead poisoning, however, to be of non-industrial origin. A chemical study of 102 lead conducted water supplies in Massachusetts towns showed that all contained lead. The lead content was most strikingly related to the carbon dioxide content. Of 253 exposed persons, 63, or 24.9 per cent, were poisoned. The incidence was less in young children and greater in adults. Women showed a lower incidence of poisoning than men.—Wade Wright, *J. Indust. Hyg.,* 10, 7: 234–235 (Sept.), 1928.

Tuberculosis as an Industrial Accident—Closely analyzing 76 cases (Mass.) in which tuberculosis of the lungs was the "personal injury" involved, and for which compensation was demanded, has resulted in some interesting findings. Of the cases, 27 were granite workers with an average of 30 years' exposure. In the case of 12 others there could be no doubt that the tuberculosis in each case constituted a true personal injury, as each one followed a fairly serious accident, usually involving the chest. On the other hand, there were 20 cases in which there was no relation between the accident or occupation and the disease. In fact in 14 of these no tuberculosis was found, the correct diagnosis being various other bronchial and lung conditions. One claimed glass dust hazard, but investigation showed such to be practically im-

possible. One claimed soapstone dust hazard, but no lung trouble was found, nor did the hazard seem appreciable. One claimed sulphuric acid fumes as a hazard, but investigation showed no evidence of such fumes although the acid was used. Another claimed dust from copper wire, but investigation showed no evidence of any dust whatsoever. Another claimed dust from a belt of sandpaper where it was found that protection was good, the amount of dust small and the periods of exposure very short. These cases show that tuberculosis is used as a convenient diagnosis on which to base claims for compensation in far too many instances.

Finally there was a third group of 14 border-line cases in which there was a possibility but not a probability of a just claim. (A detailed discussion of each of these cases is given.)—John B. Hawes, 2d, *Am. Rev. Tuberc.*, XVIII, 6: 767–775 (Dec.), 1928.

Some Measurements of the Transmission of Ultra-Violet Radiation through Various Kinds of Fabrics—It is necessary to examine black and white samples of the same cloth or fabric, to examine different kinds of weaves, and to determine the effect of dyes, before drawing conclusions regarding the transmission of ultra-violet rays. Even a slight yellowing with age decreases transmission. After deducting for the openings between the threads, the actual transmission through the threads, especially when dyed, is only about 5 to 10 per cent. As the threads usually occupy from 95 to 99 per cent of the total space, the transmission through a fabric material itself is usually insignificant. Therefore, transparency to ultra-violet radiation demands an open-weave fabric. On this basis fabrics made of silk and heavy wool yarns compare favorably with cotton and rayon. Evidently the question of the composition of the material for transmitting the ultra-violet has been overestimated. In passing through two or more layers of fabrics, transmission is greatly decreased.

The best reflector for sunlight is a closely woven white fabric, and such should be worn to protect the body from the ultra-violet rays in the tropics; a further protection would be to wear an inner garment of thin closely woven material of wool or cotton, dyed with a substance that absorbs ultra-violet rays. It was found that transmission through feathers was fairly high, even for colored feathers (tables and graphs accompany).—U. S. Bureau of Standards, *Journal of Research, Research Paper 6,* Aug., 1928, pp. 105–124.

Physiological Factors of Mine Ventilation—An historical resumé of recent investigations on silicosis is discussed in the first 5 pages, followed by a summary of recent investigations on high temperatures in which the importance of acclimatization and the protection against heat in deep mines is emphasized. Drinking water in the Witwatersrand contains a little lime juice and 7 gm. of ordinary salt per gallon, the tins being provided at all levels in the mine. The author discusses in some detail the methods of mine refrigeration, the findings of fatigue studies, and the relations of the "comfort zone." The article concludes with a summary of recent investigations of toxic gases found in mines, viz., oxygen, methane, hydrogen sulphide, and carbon monoxide.—R. R. Sayers, U. S. Bureau of Mines, *Circular No. 6089,* Nov., 1928, 16 pp.

The Ultra-Violet Transmission of Various New Glasses and Window Glass Substitutes as Compared with That of Common Window Glass—Ordinary window glass shuts out ultra-violet rays below about 310 $\mu\mu$. The U. S. Bureau of Standards finds that the

total transmissions of various glasses, when new, are as follows:

Trade Name	Per Cent Transmission
Fused quartz	92
Corex	92
Helioglass (Vioray)[1]	50
Vitaglass	50
Cel-o-glass[2]	20
Quartz-lite	5
Flexoglass[3]	1
Common Window Glass	0 to 5

1. Vioray is the foreign trade name for Helioglass.
2. This consists of a fine wire screen whose interstices are covered with cellulose acetate.
3. This is a loosely woven fabric usually covered with paraffin.

A sample of Vitaglass which had been in a hospital window in Rhode Island for a year was found to have a transmission of 25 per cent at 302 $\mu\mu$ (for thickness = 2.3 mm.). Helioglass was found to decrease in transmission at about the same rate. Corex glass appears to undergo no appreciable change in transmission when exposed to solar radiation, but a marked decrease when exposed to a quartz mercury arc. Cel-o-glass (cellulose acetate), which when new transmitted 30 per cent, after being exposed to daylight for 8 months transmitted only 5 to 10 per cent. Quartz-lite is not appreciably affected by sunlight, and only slightly by the quartz mercury arc. The thinner the glass in any case, the greater in general will be its transparency to ultra-violet rays (tables and one chart accompany). —U. S. Bureau of Standards, *Letter Circular 235* (3d rev.), Jan. 14, 1928, 6 pp.

Health and Recreation Activities in Industrial Establishments—This illustrated bulletin considers medical and hospital service for employes, sick leave with pay, vacations with pay, lunch rooms, indoor recreation, outdoor recreation, disability funds, group insurance, education, encouragement of thrift, administration of personnel work, and welfare work in company towns.—U. S. Bureau of Labor Statistics, *Bulletin No. 458*, Feb., 1928, 94 pp.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Synthesis of Vitamin B in the Rumen of the Cow—One of the authors in previous studies of vitamin B requirements disclosed that a calf will grow to maturity and produce offspring on a ration deficient in vitamin B complex. These observations led to the present study to determine the microörganisms in the rumen responsible for the synthesis of vitamin B complex. A pure bred heifer with a fistula 3½ inches in diameter in the rumen was the experimental animal. Alcoholic extracts from the rumen were taken 12 hours after feeding in portions of about 30 pounds and the material was incubated for 5 days at 37° C. in order to induce the growth of bacterial flora. Ethyl alcohol was added until approximately 70 per cent solution was obtained, which was filtered off and evaporated to dryness at 50° C., 1 gm. of the dry extract representing 25.4 gm. of the fresh rumen material. Experimental rats, 21 days old and about 40 gm. in weight, were fed a ration of casein, agar, olive oil, dextrine, dextrine rumen extract and McCollum and Simmonds mixture 185. Olive oil was incorporated in the ration in both normals and controls as the animals refused to eat the rumen extract because

of the butyric acid. In addition, cod liver oil was given to insure adequate vitamins A and D. Growth curves indicate the vitamin B complex in the rumen extract as the animals maintained good growth through an 8-week period, pointing to the synthesis of this complex in the cow's rumen. Microscopic examination of rumen smears showed neither acid-fast bacteria nor yeasts but a bacterium producing pale lemon-yellow colony which had not been previously described. The authors designate it "Flavobacterium vitarumen." Cultures of this organism were grown on suitable mediums, the growth washed off with sterile water and evaporated to dryness at 50° C. Similar feeding technic for the dried bacterial meal was employed as with the rumen extract. The chart indicates the satisfactory average growth of the rats. It is concluded that the vitamin B complex was produced in the rumen by bacterial fermentation and an explanation is offered as to why cattle may grow to maturity producing normal offspring and normal milk on an insufficient vitamin B ration.—S. I. Bechdel, Hannah E. Honeywell, and R. Adams Dutcher, *J. Biol. Chem.*, 80: 231 (Nov.), 1928.

The Manganese-Copper-Iron Complex as a Factor in Hemoglobin Building—Previous work has shown both manganese and copper effective in hemoglobin regeneration, and the high purity iron salts ineffective. The work here describes the results obtained by the addition of copper individually and in conjunction with the milk-iron diet. Four-week old rats were placed on whole milk diet until the hemoglobin content was reduced. Fresh cow's milk was fed *ad libitum* and the supplement added to the morning feed. Weight determinations were made weekly, and hemoglobin determinations were made with a Fleischl-Miescher hemoglobinometer from blood secured from the caudal vein puncture. A table is given showing hemoglobin growth data for rats on the milk-iron diet, the iron component being prepared from pure iron wire. Rats with high hemoglobin at the start utilized iron to some extent, but those with low hemoglobin could not utilize iron without the supplements. The milk-iron diet was supplemented with 0.05 mg. copper per rat per day in the form of the sulphate prepared from electrolytic copper. All animals showed increased hemoglobin in accordance with reports of previous workers. Milk-iron diet, supplemented with 0.1 mg. of manganese per animal per day in the form of the chloride from manganous carbonate, showed good growth and hemoglobin increase. Few failed to respond. When both copper and manganese supplemented the milk-iron diet the most rapid response in hemoglobin of any group was evident, confirming the suggestion of Whipple that the evidence points to a group of substances as the active principle.—R. W. Titus, H. W. Cave, and J. S. Hughes, *J. Biol. Chem.*, 80: 565 (Dec.), 1928.

The Mineral Constituents of Cranberries—Most of the nation's supply of cranberries grows in Cape Cod whose ground waters are noticeably high in chlorine effected by the proximity of the ocean. The mineral content of cranberries was studied on ½ barrel packages received at intervals during 1926. The air-dried, ground berries were analyzed according to the Methods of Analysis, Association of Official Agricultural Chemists, except that potassium was weighed as the perchlorate and iron was determined in samples which had not been cut, and had been ground in a porcelain mortar. A table is given indicating a relatively high content of manganese. Total ash is low, generally less than 0.2 per cent, with an alkalinity of about 2 c.c. normal NaOH per 100 gm. berries. A previous

paper by the author (*J. Biol. Chem.*, 79: 409, 1928) showed iodine content from 26 to 35 parts per billion.—Fred W. Morse, *J. Biol. Chem.*, 81: 77 (Jan.), 1929.

Antirachitic Potency in Relation to Volume of Oil in the Liver of the Cod—A variability in the antirachitic potency of cod liver oil in relation to vitamin A has been known for some time. As a rule, livers assayed have been those obtained in spring and summer months when they are fat, large in proportion to the weight of the fish, and contain a large amount of oil. In fall and winter the livers decrease in size as well as in oil content. The authors have had an opportunity to study a large number of cod in the Bureau of Fisheries, Woods Hole, Mass., throughout the year, and the records show that fish livers obtained at different seasons are of varying sizes and varying contents of oil. The livers were extracted with cold ether and, after evaporating, the remaining oil was assayed biologically by placing young rats on a low-phosphorus McCollum ration and noting the percentage of oil necessary to produce calcification within 5 days. On this method, a score of 100 was established for high grade medicinal cod liver oil and the accuracy was assured by the use of a large number of animals. Tables are given showing the potency of oils from individual livers compared with the weights of the livers, the amounts of the oil in the liver and the ratio between them. The low potency was 150 and the high 20,000. In the first case the liver oil ratio was 5 and in the latter it was 167, and in this instance the liver which weighed 45 gm. contained only 0.27 gm. of oil. The authors concluded that, for a fish of given size, antirachitic potency varies invariably with the oil in the liver, provided the livers are decreased in fat content and not increased. Segregating a number of the low potency and high potency and comparing them, it was found that in the high group the figure was about 30 times that of the low, but that the average weight of the livers is only about ⅓ in the former case of those in the latter, and the average quantity of oil about $\frac{1}{60}$ of those in the low group. The question as to how the antirachitic factor is soluble in liver fat when the liver fat is consumed is explained by the possibility of the oxidation of the liver fat in the course of starvation. In an attempt to answer the question as to whether this vitamin is synthesized by the liver, cod liver was divided into three different parts; one was extracted with ether, one boiled to destroy the enzymes and then extracted with ether, and to the third ergosterol was added as a substrate. Biologic assays showed no distinction in potency among the three portions of the liver, indicating no activation of the ergosterol by the liver cells. The authors, however, feel this is not conclusive in representing conditions *in vivo*. It is pointed out that cod liver oil may be 200 times as potent as that designated "high grade," and that such potent oil is very dark and obtainable only in very minute amounts.—Alfred F. Hess, Charles E. Bills, Edna M. Honeywell, *J. A. M. A.*, 92: 226 (Jan. 19), 1929.

Mucosus Organism from Suppurative Lesions of Rat on Diet Deficient in Vitamin A—Following the theory that deficiency of vitamin A causes such a reduction in cellular activity that it amounts to a deficiency of glandular activity and that this, in turn, brings about secondary changes, bacterial invasion and death, cultural studies of a group of animals dying from avitaminosis were made. Cultures were taken from the kidneys and from the ears of 31 white rats immediately after their death from experimentally pro-

duced deficiency in vitamin A. *Staphylococcus albus,* an organism of the Proteus group, and *B. coli* were isolated in a few cases but an encapsulated, Gram-negative, coccoid bacillus apparently belonging to the mucosus capsulatus group was isolated from 15 cases. In 12 of these cases it was the only organism present in the cultures. Morphological, cultural, serological and pathological studies of the organism showed it to be a Friedländer-like bacillus of low virulence for rabbits, guinea-pigs, mice and white rats when injected intraperitoneally or intravenously. Extending the study to other groups of animals, from 50 rats on A-deficient diets, representing 3 different stocks, 21 strains were isolated. In 13 normal rats, 3 rats on B-deficient diets, and 9 rats on D-deficient diets, all without obvious infections, cultures from the ears and nose failed to reveal the organism. Although obviously more frequently present in the suppurative conditions of the animal on an A-deficient diet, it is probably a secondary invader of mucosa of the respiratory tract, made suitable for its invasion by the dietary deficiency.—William L. Bradford, *J. Infect. Dis.,* 43: 407 (Nov.), 1928.

Thermophilic Bacteria in Canned Foods—The organisms described in this paper were isolated in the examination of 65 cans of food, including normal and spoiled corn, sound and "flat sour" peas, tomatoes, beans, pumpkin, meats, fish, evaporated milk processed cream and "swelled" canned fruits. Twenty-three cultures were isolated and studied in detail. These cultures were obtained from market corn and peas incubated at 55° C., from "flat sour" peas, and "swelled" cans of pumpkin. The remaining cans of normal and spoiled foods did not yield thermophiles. The cultures fell into 2 groups: 21 apparently closely related and probably identical strains; and 2 that corresponded with each other but not with the majority of those isolated. The minimal temperature for growth of the organisms studied was 42° C. and the optimum temperatures were between 55° C. and 62.5° C. At pH between 5.8 and 8.2 growth occurred within 18 hours at 55° C. regardless of the reaction. All the strains studied fermented dextrose with the production of acid but not gas. They also formed acid from various other carbohydrates. In studying the resistance of the spores to heat it was indicated that 17 hours at 100° C. was not sufficient to destroy the spores in the given medium with the given concentration of spores, which varied from 36,000 to 500,000 per c.c. as determined by the plate method. Sourness, with pH 4.7 to 5.5, was produced by inoculating peas and corn with organisms of the larger "flat sour" type group. The 21 organisms of this group which were identical and which were isolated from "flat sour" vegetables were found to resemble closely *B. stereothermophiles* Donk and were considered the cause of "flat sour" spoilage. The 2 remaining cultures seemed unlike the others and unlike any previously described in the literature. They were considered a new species and named *Bacillus pepo.*—Myrtle Shaw, *J. Infect. Dis.,* 43: 461 (Nov.), 1928.

Discontinuous Variation in the Virulence of B. aertrycke (Mutton)—It had been observed that different strains of *B. aertrycke* (mutton) showed a definite decrease in virulence when subcultured daily in broth. This change in virulence suggested the possibility of some bacterial dissociation resulting in the replacement of the original virulent organisms by variants much lower in virulence. Another possible explanation of this phenomenon was that the virulence of the constituent organisms was gradually falling, be-

coming evident only at a given point on the downward curve based on the four-dose technic used by Lockhart. In order to test which of these possibilities —if either—was true, a series of experiments was undertaken, including a repetition of Lockhart's experiments, testing, however, the virulence not only of the whole culture but also that of some of its constituent organisms. On the basis of these experiments the author concluded: (1) That a pure culture of *B. aertrycke* may contain individual organisms showing markedly discontinuous variations in virulence, when tested by intraperitoneal inoculation of mice. Side by side regardless of whether colonies were rough or smooth forms individual organisms comprising the parent strain showed marked difference in virulence, although otherwise indistinguishable from one another by the ordinary methods of examination; (2) That when a given strain comprises organisms showing discontinuous variations in virulence, the virulence of the entire culture is similar to that of the most virulent variants. While not entirely conclusive the experiments indicate that this proposition may be subject to definite quantitative limitations. It was observed that if even 10 per cent or less of the constituent organisms of a culture are fully virulent, the whole culture will itself prove fully virulent; (3) Whole cultures exhibiting a similar degree of virulence are not necessarily similar in constitution. In other words, the virulence of a culture of *B. aertrycke* in its entirety affords very little guidance to the virulence of the individuals present or to the proportion in which the variants are present; (4) There is no apparent basis of comparison to indicate any relationship between the possession of a type or group antigen and the degree of virulence of *B. aertrycke* (mutton); (5) There is no constant relationship between the virulence and the infectivity of a given strain of *B. aertrycke* when introduced directly into the tissues; (6) Daily subculture in broth of this organism with incubation either under ordinary aerobic conditions or in an atmosphere of 1 per cent or 21 per cent oxygen maintained by bubbling the gas continuously through the culture results in time in a complete fall in virulence. The evidence brought forward by the author indicates that it is wrong to regard a whole pure culture as a collection of homogeneous organisms. Any given culture consists of an extremely large number of individual organisms which vary in one or more respects. Side by side in the same pure culture there have been found virulent and entirely avirulent individual organisms. It is suggested that loss in virulence may be explained by replacement of virulent individuals of a culture by avirulent or weekly virulent organisms. —G. S. Wilson, *J. Hyg.*, 28: 295 (Dec.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

A Study of 370 Deaths of Primiparae—The problem of maternal mortality is such a pressing one, and so little is really known about the basic factors involved, that every death in childbirth should receive the most careful study possible. To individualize cases in this fashion is relatively expensive and the results thus far have yielded more chaff than grain; but by staggering the load among many health departments and other agencies, returns will undoubtedly come in time.

This study which Dr. DeKruif reports is an analysis of causes of death among a group of primiparae whose histories were investigated as part of a larger study of 984 deaths of mothers in childbirth, undertaken by the Massachusetts Department of Public Health. The data were obtained from the physicians who had charge of the patients and from hospital records.

The two principal causes of death among these primiparae were sepsis (primary and secondary) and the toxemias. Cesarean section leads as the method of delivery. This operation seems, however, to have been—with the exception of low forceps—the measure most favorable to the baby.

Other interesting facts brought out are: The toxemia group led as a cause of prematurity; there were 157 hospital booked, 119 hospital emergency and 80 home deliveries. Seventy-two per cent of these primiparae were operative cases whereas 53 per cent only among 614 multiparae were operative.

There was evident lack of prenatal care in 73 per cent of the cases. One-third had no prenatal care at all. It should be said, however, that in about one-third of the cases the cause of death had little or no apparent relationship to the prenatal care.—Mary DeKruif, M.D., A Study of 370 Deaths of Primiparae, *New England J. Med.*, Dec. 27, 1928.

Maternal Care in Berlin—According to recent reports, the city of Berlin endeavors to protect the health of its prospective mothers by means of 40 municipal centers for the care of pregnant women. These centers are staffed by gynecologists, graduate nurses and officers of the juvenile and public welfare departments.

The service offered here is free to all, rich or poor. No credentials of any kind are required. Among the types of service offered are: examination, medical advice, medical treatment, financial aid, legal information, accommodations before and during confinement, accommodations for mother and child, and nursing care at home.—Organization of the Care of Pregnant Women in the City of Berlin, Foreign Correspondence, *J. A. M. A.*, Dec. 29, 1928.

Maternity Care in the Australian Bush—For a number of years Australia has had a system of "maternity benefits," consisting largely of a cash subsidy at the time of confinement. Apparently nearly every mother of a newborn baby avails herself of this maternity benefit, so-called. This service, so far as one can judge by the figures, has had no appreciable effect on the maternal death rate of that country.

Another plan, this time directed toward the rural districts of the State of

Victoria, at least so far as the white inhabitants are concerned, has been in operation for more than 17 years. This consists of nursing, medical and hospital service sponsored by the Victorian Bush Nursing Association.

The report of this organization of its work during the 5 years ending in 1927 is most interesting. Twenty-two hundred and seventy-three confinements of white mothers were attended without the loss of a mother. The "bush" now has the lowest maternal mortality rate in Victoria, with the city of Melbourne—containing more than half the population of the state—holding the record for the highest rate. The average rate for Victoria is given as 5.58 per 1,000 live births.

It is natural enough that the association should attribute this favorable mortality experience "to the adequate training of both doctors and nurses and their excellent coöperation, insistence on continuous antenatal supervision, and properly planned, staffed and equipped hospitals to which all complicated cases are removed at the earliest moment." Whether this is the whole story or not is not so certain. We have yet much to learn regarding the part played by racial and other factors entirely apart from measures consciously directed against the maternal mortality.—Based on Note in *The World's Children*, Dec. 19, 1928.

Tonsillectomy in the United States—A recent editorial in the *Journal of the American Medical Association* discusses at some length various studies which have brought forward evidence as to the value of tonsil removal. It quotes a government report as estimating that about one-third of all operations since 1924 among the American urban population were for the removal of tonsils or adenoids.

The results of tonsillectomy may be viewed from various angles. The first question that comes to mind is, naturally—what is the effect on the incidence of rheumatism?

Kaiser reported on 48,000 school children, in 20,000 of whom the tonsils had been removed and in 28,000 of whom they had not been removed. He found the incidence of rheumatic fever, joint pains or growing pains and chorea slightly less in the tonsillectomized patients than in those whose tonsils had not been removed, but the difference was so slight as to be almost negligible. However, he calls attention to the fact that many with rheumatic manifestations in the tonsillectomized group had had their symptoms before operation.

Rheumatic heart disease was found in 450 of the 20,000 children with tonsils removed as compared with 817 cases among the 28,000 children not operated on.

Turning to other diseases, Collins and Sydenstricker from Hagerstown, Md., report a decrease in all respiratory diseases in tonsillectomized children; but this decrease was not great except in the case of tonsillitis and sore throat. Morbidity from non-respiratory causes was not noticeably lessened. On the other hand, during a 4-year period more scarlet fever, mumps, measles, whooping cough and chicken pox occurred in the tonsillectomized than in the non-tonsillectomized group. Diphtheria proved the exception with 4.6 cases per 1,000 in the non-tonsillectomized cases as compared with 1 per 1,000 in the children who had had their tonsils removed.

It is to be pointed out that two factors have to be considered in judging these figures—first, many tonsillectomies are imperfectly done, leaving a residue of tissue which renders the patient worse off than before; second, confusion is injected into the situation by the fact that there is as yet no uniformity regarding what constitutes a "normal" tonsil and what is the significance of an "enlarged" tonsil.—Tonsillectomy in the United States, Editorial, *J. A. M. A.*, Oct. 20, 1928.

Behavior Problems in Children under Three Years of Age—Preventive mental hygiene, we realize, has not kept up with the advancement in preventive medicine. The feeling that the specialist only can handle behavior problems among young children has been too prevalent. It is the family physician, after all, who has the opportunity to detect such problems, as he gets these young patients first. "The prevention of rickets with its subsequent malformation, which the orthopedist would have to correct, is analogous to the prevention of behavior disorders, whose subsequent maladjustments must be handled by the psychiatrist."

Mental and emotional life begin at birth. Behavior problems should be discussed with the mother as often as she visits the doctor regarding the physical care of her child. The earliest feelings of security and protection so necessary to the infant are apt to be prolonged by the fond parents and thus make trouble. Physical development is beyond the parents' power to delay and incoördination between physical and psychic growth results, which leads to behavior disturbances.

All ordinary reactions occur in all children to some extent, such as crying when left alone and refusing to go to sleep in the dark. It is only when such reactions are excessive and prolonged beyond the regular age limit that they may become difficult to overcome. A normal child meets new situations—weaning, toilet training, etc.—with comparatively easy adjustment, but the child who deviates from normal behavior will find it difficult and may show aggressive revolt by means of tantrums, crying spells, etc. The coöperation of all the persons in the child's environment is essential to effect a change of behavior. Thorough physical examination should precede all treatment, as abnormal organic conditions may be present.

The author illustrates her conclusions by interesting case stories.—Margaret E. Fries, M.D., *Arch. Pediat.*, Nov., 1928.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Another School of Nursing is Endowed—The endowment of $1,000,000 from the Rockefeller Foundation to the Yale University School of Nursing was announced in January, 1929.

The gift signified the success of an experiment carried on for 5 years to determine whether an educational program for nurses could be made comparable to that offered by medicine, law and engineering. Substantial financial backing assures the stability and continuation of this advancement in nursing education. (Of 116 students now enrolled, over one-half are college graduates.)

Outstanding features of the plan which has been endorsed by the Rockefeller Foundation are high admission requirements, emphasis on the study of fundamentals, and practical experience.

The Yale School of Nursing was founded in 1923 for the purpose of offering better educational opportunities for nurses, rather than increasing the number of graduates. Two years of college were required for entrance and the course included 28 months of practical and theoretical work under the direction of the New Haven Hospital.

A New Director for the National Organization for Public Health Nursing—The National Organization for Public Health Nursing has announced the appointment of Katharine Tucker, R.N., as General Director, March 1. Miss Tucker has been a moving spirit in public health nursing activities and has recently been the Director of the Visiting Nurse Society of Philadelphia.

Knowing as she does both the national and local aspects of public health nursing, Miss Tucker is uniquely fitted for the position. For several years she has served as a member of the Board of Directors and has also done field consultant work in surveying Visiting Nurse Associations.

What Every Nurse Should Know about the I. C. N.—Shall we see you in Montreal next July? The International Council of Nurses meets there from July 8 to July 13 for the first quadrennial convention since the one held in Helsingfors, Finland, in 1925.

Each American visitor or delegate to Montreal should have at her finger tips the history of this world-vide organization; otherwise, she will be confronted by enthusiastic delegates from foreign countries, for whom this is an open book, while for her it is still largely a matter of haphazard conjecture.

An article in the January issue of the *American Journal of Nursing* by the President of the International Council of Nurses, Nina D. Gage, R.N., contains this valuable information.

The International Council of Nurses was organized in London, England, July 2, 1899, and nurses from six different countries were listed as Foundation Members. The idea of forming international affiliations germinated at the time of the World's Fair in Chicago, 1893. At the same time a permanent organization for nurses, later known as the League of Nursing Education, was established in the United States. The objects of the International Council of Nurses are:

1. The advancement of the nursing profession by unity, thought, sympathy and purpose, in an attempt to improve the nursing care of the sick; to promote the health of the nations and to secure the honor and interest of the profession.

2. Self-government by the nurses in their associations, with the aim of raising the standards of education, professional ethics and public usefulness to their members.

3. The development of "the human being and citizen in every nurse," thus enabling her to bring her skill and professional knowledge to the many-sided service that modern society demands of her.

4. Provision for a means of communication and conference between nurses of various nationalities, and facilities for the interchange of international hospitality.

Admission to membership ever since 1904 has been through national organizations. Since then many countries have been admitted to affiliations, so that in 1928, 31 countries were represented.

All dues have been assessed on a basis proportional to the size of the constituent organization. Each individual member of the organization is taxed 5 cents in United States currency, as of January 1, each year; thus, if an association has 1,000 members, it pays $50.00 each year. The affiliated members represent more than 95,000 nurses.

Business is carried on by conference and correspondence between the headquarters in Geneva and various organizations. Conventions are held quadrennially, the program meetings of which are open to everyone. Each affiliated member association may send 4 duly accredited delegates, besides its president, to form with the officers and honorary officers the Grand Council, the voting body. American nurses are familiar with this kind of organization, as it corresponds to the House of Delegates of the American Nurses Association. The forming of friendships is a most important part of the convention.

The work of the International Council of Nurses is to draw together nursing councils from different nations; to disseminate among them professional information useful to all; to raise the standards of nursing education throughout the world; to offer assistance and advice to nurses; to arrange for subsequent meetings for the general consideration of important nursing matters and for the deliberation of questions of common interest and importance to nurses in every country.

There are committees on membership, program, arrangements, nominations, publications, revision, finance and nursing education. Many of us remember receiving with pleasure copies of a multigraphed bulletin, which Miss Reimann, Secretary of the Council, made so valuable. The popularity of that bulletin led to the indispensable magazine which has been issued quarterly since 1926.

Since 1925, Geneva, Switzerland, has been the headquarters of the International Council of Nurses (14 Quai des Eaux Vives). There, a nucleus of a small, but valuable, library is located. It is hoped that this will grow steadily and in the future become the center for research and study.

The progress and development of the International Council of Nurses (the first professional and scientific organization to become international) has been due to the vision and leadership of some of our ablest nurses. Mrs. Bedford Fenwick of England, the founder, has watched over the council from the beginning; Miss Breay was the faithful treasurer for 23 years; Miss L. Dock was the secretary for 23 years. Sister Agnes Karll exerted wide influence, not only in Germany, but throughout the world. Miss Nutting, as second chairman of the Education Committee, contributed the inspiration which has helped to raise the standards of education in many countries. Anna Maxwell of New York and Miss McMillan of Chicago have given valuable help and counsel. Baroness Sophie Mannerheim,

of Finland, served as president with a singleness of purpose that characterized everything she did. Miss Goodrich, Miss Noyes, Sister Bergliot Larssen and Christiane Reimann, the present capable, clear thinking, cosmopolitan secretary, are other leaders whom we have to thank for maintaining a truly international group and for piloting the organization through to safe waters.—The International Council of Nurses, *Am. J. Nurs.*, 29: 1 (Jan.), 1929.

Effect of the Grading Committee Report on Schools of Nursing—To quote Miss Hall, "I doubt very much if the first report from the Committee on the Grading of Nursing Schools has yet had any tangible effect upon the nursing schools in the country."

The report of the Grading Committee on Schools of Nursing given at Louisville indicated 4 almost overwhelming tasks for the nursing profession:

1. To reduce and improve the supply of nurses
2. To replace students with graduates
3. To help hospitals meet costs of graduate service
4. To get public support for nursing education

The idea of immediately reducing and improving the supply of nurses, both in small and large schools, is staggering. For a long time, the practice has been to let the nursing schools answer the needs of the hospital. Now the question of student enrollment must depend upon how many graduates may find employment and support. The problem of the training of the nurses, so vital to them, does not appear to be so important to many of the trustees of the hospital as the needs of the institution. Much educational work will have to be done before the recommendations of the committee are put into practice. Entrance requirements may be gradually raised, and this will improve the quality of the graduates.

"It is about as easy to put into practice the implications of the report as it is to enforce prohibition." Before either can be done, each endeavor must have the support of the public at large. The nursing profession cannot alone bring about the reform in nursing education.—Carrie M. Hall, R.N., Effect of the Grading Committee Report on Schools of Nursing, *Am. J. Nurs.*, 29, 2: 129 (Feb.), 1929.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

HONORABLE MENTION

For having "Contents" (at the front) and "Index" (at the back) in Biennial Report: to Bureau of Public Health, New Mexico.

For the title "Adventuring for Health" and the cover-page of the 1909–1929 report: to Welfare Division, Metropolitan Life Insurance Company.

For refreshingly unconventional design and color scheme in health posters: to Chicago Tuberculosis Institute.

To Health Department of Pasadena, Calif.—for including an index in its annual report.

To Tuberculosis and Health Society of Detroit and Wayne County, Detroit, Mich.—for table of contents in "Three Years at the Dubois Health Center" (a 31-page report).

MOTION PICTURES

A 14-page description of the Dr. Canti picture of cancer and radium effects, with details of the picture-making technic, is supplied by American Society for the Control of Cancer, 25 West 43d St., New York, N. Y.

A supplement to *Motion Pictures of the U. S. Department of Agriculture*, Washington, lists "How to Get Rid of Rats" (1 reel), and "Food Makes a Difference" (2 reels)—the latter picturing results of proper nutrition for children of preschool age, food laboratory tests of effects of foods, etc.

Possibilities in the use of amateur movies are well worth consideration by local health agencies. An important first step would be to get acquainted with *Movie Makers*, Amateur Cinema League, 105 West 40th St., New York, N. Y. *Sample free.*

IDEAS AND DEVICES

"Let's Fill the Gaps!" is the slogan of the Southside Health District, Dr. W. A. Brumfield, director, Farmville, Va. The 9 rural counties in the district are listed at the side of the District letterhead—with the names of the sanitation officer and the county nurse, or a blank line where one or both are not on the job. Dr. Brumfield is also head of Southside Hospital, constructed under the auspices of the Commonwealth Fund. Reported by C. E. Lakeman.

It does not look like a health department communication: "the Milwaukee Health Department's birthday letter to all 3-year-old children in Milwaukee and their mothers, calling attention to early correction of physical defects and to vaccination and diphtheria immunization, as well as early dental care. The letters are mailed by the nursing division so as to reach the mothers a day before the 3-year-old's birthday anniversary. Newspapers gave liberal space to the idea and a few of them reprinted the entire letter. The mailing started January 1, 1929. The largest daily in Milwaukee ran a picture of one of the first mothers to get the letter and her little daughter. They were selected because they were 'gold coast' residents, and their names helped to boost preschool child health work along." Reported by George A. Dundon.

There are 4 pages—on the first page: a wood-engraving type of picture of 5

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

men of the period when beards were beards—the caption being "As they wore them in anti-Gillette days"—and "Looking Backward" in the lower right corner. On the inside is "Yet Going Forward," with text about printing equipment. *Free* of De Vinne-Hallenbeck Co., 80 Lafayette St., New York, N. Y. Idea adaptable to annual report, annual meeting, and promotion projects.

A blotter with one edge accurately copying 6 inches from a foot-rule was distributed by a mimeographing shop.

"Social Hygiene" is on the tab of a 3 x 5 card. Below is a brief description of the American Social Hygiene Association, 370 7th Ave., New York, N. Y. At the bottom of the card: "Slip this card into your reference file." *Free.*

Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y., makes much use of the mimeograph—with colored paper and illustrations. Samples *free.*

For next summer: a street scene in red with "From blazing city streets . . . ." followed on 5th page by a country scene in green with ". . . to the cool green country." Inside: effective text on the summer services of Associated Jewish Charities, Baltimore, Md. *Free.*

REQUESTS

"Do people make use of the health information services offered in St. Louis, New York, and other cities? What difficulties have developed in handling such services?" Please address the editor.

"Can you advise us where it would be possible to obtain some illustrated charts suitable for lectures on oral hygiene. We would like to get some in which the illustrations would be of the cartoon type as well as some of a more serious nature. If there is any material of this description now being used in South America, we would be particularly pleased to get in touch with the source." Please tell the editor what you know.

TIMELY TOPICS

The Minnesota Public Health Association, St. Paul, Minn., issues a folder on "The 'Teen' Age and Its Tuberculosis Danger." It says: "One-fourth of all deaths in the 'Teen' Age are from tuberculosis. Twice as many girls as boys are patients in the tuberculosis sanatoria of Minnesota." Also: "Tuberculosis takes two 'Teen' girls for every boy. Fads That Kill: Reducing, Jazzy Life, Scanty Clothes, Lack of Rest." The editor fears that the full force of the special appeal is lessened by charting the leading causes of death *for all ages. Copy for 2 cents.*

"After All, This Is a World for Well People," by Wallace Myer. *Magazine of Business,* Chicago, Ill., Aug., 1928. 35 cents. Quotable on vacations and outdoor life for business men.

"Stews and Frys"—oysters and what the local health department does to protect the oyster eating public. Board of Health, Racine, Wis., Nov. 17, 1928.

TITLES AND PHRASES

"Even Your Friends Won't Tell You"—Tuberculosis and Health Society, 613 Locust St., St. Louis, Mo. Readable paragraph on getting a "big front."

"Select your doctor now and see him regularly"; "Most sickness is preventable."—Metropolitan Life Insurance Company.

VOLUNTEERS

How volunteers help at a health center—told in three short articles. In *Alameda County Public Health News,* 121 East 11th St., Oakland, Calif., Nov., 1928. *Free.*

"Volunteer Varieties: Various Vocations for Volunteers in Social Work"

—a 24-page booklet of the Volunteer Service Bureau, American Red Cross, 45 Newbury St., Boston, Mass. Under "Art," "Dramatics," "Health Education," and "Office Work" are jobs for volunteers in health education-publicity. The clever pen-line drawings on every page are suggestive for printed matter or mimeographing. Enclose 4 cents for a copy.

DATES AHEAD

March 31–April 7: National Negro Health Week. Address: Health Week Committee, Tuskegee Institute, Ala.

April: Early Diagnosis Campaign. Address: any tuberculosis association.

June 26–July 5: The next special opportunity for conference on publicity methods—at National Conference of Social Work in San Francisco. Address: Social Work Publicity Council, 130 East 22d St., New York, N. Y. Address: *The Survey,* 112 East 19th St., New York, N. Y., about special train starting from New York.

During March the Junior Red Cross will emphasize a swimming program to reduce deaths from drowning.

Last month was notable for the use of Valentine Day and the distribution of valentine greetings by American Social Hygiene Association. For your 1930 tickler of plans ahead.

Health conventions ahead should provide material for local newspaper use.

HOUSE ORGANS

"A Little Journey to the Clinic" and "A Farm Cure for Drug Addicts" —in two issues of *Community Fund News,* 51 West Warren Ave., Detroit, Mich.—interesting examples of descriptive writing. *Free.*

Kansas City's Health, Health Conservation Association, 1020 McGee St., Kansas City, Mo., has sent postal cards asking: "Do you read the bulletin? If not, why not? Do you pass it along for others to read? Do you think it has any educational value in the promotion of interest in health? How do you think it could be improved?"

Not a bit like a health department publication was the strikingly successful holiday issue of *Health,* New Haven Department of Health. The statistical data for the month were printed on a separate enclosure. The last page urged: "Give Health Books"—and give a dozen cover pages in color.

Bellevue-Yorkville Health News (325 East 38th St., New York, N. Y.): an excellent example of good use of the mimeograph and colored paper—legal size, one sheet, bi-monthly, addressed to neighborhood health workers and leaders in all coöperating groups. *Free.*

A list of fellows and a list of members of the A. P. H. A. from New Jersey who attended the Chicago convention were published in *Public Health News,* New Jersey Dept. of Health.

A brief sketch of a new school nurse in Indiana, in *Echoes* of Division of Public Health Nursing, mentions that the placement was made by Joint Vocational Service—a helpful way of emphasizing that service.

"This Month's Recommended Book —*Health and Wealth,* by Louis I. Dublin—Now at the Public Library." This was displayed in a box in the center of a page in *Health,* New Haven (Conn.) Dept. of Health.

CAMPAIGNS

Correction: The Early Diagnosis Campaign will be held during April—not in March as previously announced. Moral—but not an excuse for making the error: Put the date of campaigns (and of conventions and other coming events) on all printed mention of the same—and at some prominent place in every issue of your house organ or other periodical. We believe this will save time and avoid errors.

A campaign to reach 8,000,000 women with its message is being conducted by the American Society for the

Control of Cancer, 25 West 43d St., New York, N. Y. Leading national organizations of women are coöperating. State and local health agencies are afforded a special opportunity for approaching women's organizations in this connection since more women than men die of cancer.

" A baby hunt " was one of the forms of celebration of May Day reported by the American Child Health Association conducted in Missouri to secure the examination and registration of all children in the state.

" The Bridgeport Cancer Campaign " —description of preliminary steps, use of radio, printed matter, etc. " The total cost of the campaign, aside from the literature, was $596. Of this amount, $400 was expended for stenographic services."—*Campaign Notes,* American Society for Control of Cancer, Nov., 1928.

REPORTS

" Dividends in Don'ts " is a 12-page booklet " summary of achievements for 1928 " of American Social Hygiene Association. Illustrates how a few paragraphs can tell about extensive projects. *Free.*

When you wish to prove that all public department reports are not uninteresting, refer to " Human Dividends," annual report of Commissioner of Public Welfare of Westchester Co., East View, N. Y. *Free.*

" Different persons informed," " Different persons served," and " Kind of service rendered or arranged for," are headings in the quarterly service report of the Rochester Tuberculosis and Health Association. Every item under the headings is divided between children and adults, with the total. This 8-page mimeograph report *free.*

" Publicity Did It " tells of the successful use of a report on sanitary and working conditions in candy making in New York, whereby the New York Consumers League emphasizes the " White List " over the " Black List." *Better Times,* 151 Fifth Ave., New York, N. Y., Jan. 7, 1929. 25 cents.

Now that many are struggling with annual reports it will be good to look up " Graphic Presentation of Public Health Nursing," which includes " How to Make Convincing Charts," by M. A. Burgess, *Pub. Health Nurse,* Aug., 1926. Get reprint for 10 cents from *Public Health Nurse,* 370 7th Ave., New York, N. Y. Applies to other fields than nursing.

TELLING TITLES

" Eye Aches and Eye Fakes "—*Hygeia,* Dec., 1928.

" Masked Riders · Menace " (" the battalions of disease ")—press release of New Jersey Tuberculosis League, 21 Walnut St., Newark, N. J.

" Silent Death " (carbon monoxide) —press release of Board of Health, Racine, Wis., Dec. 1, 1928.

REGRETTABLE BUT TRUE

That a Christmas seal order form, issued in a large city, had all of its more than 80 words in capitals or small caps—and three lines in 6-point type in red! Larger type is needed for legibility's sake when red ink is used—and all capitals are necessarily less readable than lower case.

That educational material of a high order of interest and value should appear, month after month, in a health department house organ set in 6-point type *and* in lines nearly 4 inches long! Happily it is not so bad as it could be —the lines are separated by leads.

EDUCATIONAL MATERIAL

" A Guide to Balanced Meal Planning," National Dairy Council, 307 North Michigan Ave., Chicago, Ill. Sample *free.* A 9″ x 7″ card, punched for hanging. One side: classified lists

—include daily at least one from each column, with diet for 3- to 7-year old child. Other side: daily menu suggestions, with foods for adults only, and foods for 3- to 7-year old children.

"Buying Health," *Saturday Evening Post* editorial reprinted in neat 4-page folder. Emphasizes "county full-time health unit." *Free.* State Charities Aid Association, 105 East 22d St., New York, N. Y.

PRINTED MATTER

If you are about to change your street address, a bright idea may result from seeing the recent announcement of the Children's Welfare Federation, 244 Madison Ave., New York, N. Y., that "We Are Moving Uptown."

"The Sign on Your House" is the cover page title of a 4-page folder. It is a happily phrased explanation of the meaning and importance of quarantine. By all means get a copy from Board of Health, Racine, Wis.

"Your Friend the Doctor"—a 4-page folder explaining "when you need a doctor," the kind of doctor to beware of, and "how to choose your doctor." Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y.

The Tennessee Tuberculosis Association wished to submit a collection of solid facts to its committees and helpers throughout the state. Under the heading, "Facts in Regard to Tuberculosis in Tennessee," the copy was printed on the Association letter-head (bearing a Christmas seal) and two attached blank sheets. The copy was set in two columns to the page. The form made the material about as readable as is possible. Cost, 1½ cents a copy—sample *free.* Mailed in No. 10 envelopes this memorandum form seems more effective than would have been an unillustrated booklet with enough pages small enough for envelope enclosure. The editor would like to see more experiments with the memorandum form for presenting facts and arguments to select groups.

Several attractively planned and well-printed folders come from the Illinois Society for the Prevention of Blindness, 203 North Wabash Ave., Chicago, Ill. In one the "Suppose Nobody Cared" theme is applied to the current activities of the society. But we do wonder if they tried to adapt their illustrations to dull finished paper before accepting such shiny paper stock. A blotter has good text and is well laid out—but it will blot only on one side. The Christmas appeal letter gains in white space by having the lists of names and other letterhead detail on the lower third of the back of the letterhead. The sheet being folded twice for a No. 10 envelope, this letterhead information faces the recipient as he unfolds the letter. (It takes so many words to state a very simple fact.)

LEAGUE OF NATIONS NEWS

C.-E. A. WINSLOW, DR. P. H.

THE Second International Conference on sleeping sickness convoked by the Council of the League of Nations was held in Paris, November 5–7. It considered the report of the League of Nations International Sleeping Sickness Commission and suggested a system of administrative control of trypanosomiasis based on enumeration of native population in infected areas, adoption of an identity book or card for each native containing particulars as to health which would serve as a medical passport, establishment of boundaries at which medical authorization should be obligatory for passage, the establishment of observation posts for medical examination and, in extreme cases, the evacuation of heavily infected zones and the transportation of the population to a more favorable location. An exhaustive program of desirable research was laid down, dealing with natural immunity, spontaneous cure, and acquired immunity in man, with natural reservoirs of trypanosome infection with the relation between the different species of trypanosomes, the progress of infectivity during the cycle of transmission, and the value of various therapeutic agents. It was recommended that the health organization of the League of Nations should appoint a small expert committee to coördinate work done by various laboratories along these lines. The recommendations of the conference were approved at the 53d Session of the Council of the League at Lugano, December 11.

At this same session of the Council of the League, there was approved the program of the Health Committee for coöperation with Latin American countries involving the technical work of a specially organized leprosy commission and the continuation of inquiries at present being made in regard to infant mortality in Argentina, Brazil, Chile, Uruguay and other Latin American countries.

At a later session of the Council, the request of the Greek Government for the aid of the Health Committee in the reorganization of public health work in Greece was considered and cordially approved. Haven Emerson, M.D., has been asked to serve as a member of the special committee which will be sent to Greece to study the local problems and to aid in the development of the new program.

BOOKS AND REPORTS

Whither Mankind. *A Panorama of Modern Civilization. Edited by Charles A. Beard. New York: Longmans, Green,* 1928. 408 pp. Price, $3.00.

Readers of this *Journal* may be interested, even excited, mildly, to learn that the destination of mankind has finally been decided. Although the somewhat confused modern era is distinctly a machine age, subservient to science, it seems that we are, nevertheless, more spiritual, and that we are headed toward a period when collectivism and coöperation will supersede individualism, without, however, destroying independence and creative efforts.

Such is the trend of civilization, according to Professor Beard, who concludes this symposium on the destination of mankind with a sesquipedalian epilogue in which, using words seemingly averaging not less than six syllables, he informs us of the goal toward which he believes the other seventeen eminent contributors have headed us.

These celebrities, garnered from all over the world, discuss in an interesting if erudite manner the progress and ultimate position of such matters as Science, Business, Labor, Law and Government, War and Peace, Health, the Family, Race, Religion, the Arts, Philosophy, Play, Education, and Literature. Perhaps the most entertaining of the essays is that by Hendrik Willem van Loon on Ancient and Medieval Civilizations. There are several competitors for the one which is the least interesting.

Of special significance is the chapter on Health by Professor C.-E. A. Winslow, in which he explains brilliantly how the successful efforts of the sanitarian to prolong life and prevent disease have contributed to human progress, not by producing a race of weaklings but by accomplishing a gain in human quality as well as quantity. Another interesting chapter is that on Race and Civilization by George A. Dorsey, not because of the actual value of its substance, which is questionable, but because of the delightfully belligerent attitude with which he attempts to dispose of the so-called Nordic myth.

This book, written by a galaxy of eminent philosophers and savants, all of whom have had much literary experience, is a liberal education. Anyone who wishes to stimulate his mind with the most advanced thought on the most important integral features of modern civilization would do well to add this scholastic treatise to his reading list. It is, incidentally, well printed, and contains a number of rather bizarre illustrations.

JAMES A. TOBEY

Some Problems of Longevity—*By Frederick L. Hoffman, LL.D. New York: The Spectator Co., 1928.* 190 pp. Price, $6.00.

The question of longevity is always interesting. Most people are afraid to die, and as drowning persons will grasp at a straw, so they reach for anything which holds out even the remotest promise of prolonging life on earth.

Dr. Hoffman, whose high standing as a statistician is international, has given us an interesting book made up of thirty-five short chapters. Most of these give statistics regarding various ailments which shorten life. The chapter on suicide, which the author confesses is an unsolved problem, is an interesting preachment. Service in the army and navy is clearly shown to be conducive to long life, though it must be remembered that those entering are

carefully selected individuals. The suicide rate of army officers is astonishing.

The chief criticism that can be made of the book is that apparently some time elapsed between the preparation of the manuscript and its publication, since many of the figures given are not up to date. In the discussion of cancer, on which the author has already given us a most notable volume, he has unfortunately adopted theories for which there seems to be no ground. The statement that " white bread is so completely devitalized that it serves no genuine food requirement whatever " is wrong on the face of it, since the caloric value of such bread is high. In this idea, as well as the further conclusion that its use results in obscure bodily ills, which in turn may lead to precancerous conditions, the author is under the influence of Sir Arbuthnot Lane, which is further reflected in his advice concerning prevention.

In the discussion of leprosy, no mention is made of the great improvements in the administration of chaulmoogra oil due to the isolation of the ethyl esters by McDonald and Dean, nor of the number of patients being discharged as cured or arrested cases from the Carville leprosarium.

There is nothing in the make-up of the book which seems to warrant the price of $6.00. The print is small, but the paper is light and has a mat surface. There are no illustrations.

M. P. RAVENEL

The Basis of Breeding—*By Leon F. Whitney. New Haven: E. C. Fowler, 1928.* viii + 260 pp., 101 figs. Price, $3.00.

This is a book by a practical breeder of dogs who has a familiarity with the biological principles of the hereditary mechanism and with the structure and physiology of the reproductive system. It is written from the standpoint of the layman rather than the specialist. Though not free from technicalities, these have been reduced as far as feasible in the interests of simplicity of presentation. The text is divided into two parts, the first dealing with the hereditary basis of breeding and the second with the physiological basis. In the first part one finds chapters on such subjects as what does blood tell, the cause of sex, Mendelism, selection, pure lines, unmasking defects, inbreeding, prepotency, and breed improvement. In the second they deal with the reproductive systems, the mating cycle in man and domestic animals, birth, and sterility. There is a closing chapter with a long list of questions raised by the discussions, with references to the pages where appropriate answers will be found. The index also is very complete.

The book is very readable, full of interesting facts and much that is new regarding the breeding of dogs. It is a fresh and interesting treatment of a much discussed subject and a welcome and distinct addition to the literature of breeding.

Public health laboratories which rear their own animals will find it a valuable aid, since it deals not only with dogs, but also with rabbits, mice and guinea pigs.

C. A. KOFOID

Your Heart and You—*By Robert William Langley, M.D. Los Angeles: Wetzel Publishing Co., 1928.* 59 pp. Price, $1.50.

This short book, intended chiefly for those who believe themselves to be the victims of heart disease, covers the ground in a satisfactory manner. The causative relationship of rheumatic fever to heart disease is recognized, but is not sufficiently stressed, and is entirely omitted from chapter XII, " Facts about Heart Disease," in which it could well find a place.

The printing, paper and illustrations are good.

M. P. RAVENEL

Transactions of the Fifth Annual Meeting of the American Child Health Association—*New York: American Child Health Association,* 1928. 333 pp. Price, $3.00.

The transactions contain the papers read at the joint sessions of the Child Hygiene Section of the American Public Health Association and the American Child Health Association, when these two organizations met in Chicago, October 1928, for the Fifty-seventh Annual Meeting of the former association and the Fifth Annual Meeting of the latter. Papers read before the technical sessions of the American Child Health Association are also included. The most recent conclusions of authorities on maternal mortality, school health education, infancy and preschool problems, school medical and nursing service, dental health education, and objective standards in health education are presented in this volume.

Employment of the Tuberculous—*By Alice Campbell Klein and Grant Thorburn, M.D. New York: New York Tuberculosis and Health Association.* Price, $.50.

A 3-year experiment in "medically supervised employment for patients recovering from tuberculosis," conducted by the New York Tuberculosis and Health Association, is summarized in a book just published by the association. The study concludes that "there are no industries in which *all* jobs are suitable for the tuberculous, and on the other hand there are only a few industries which have *no* jobs suitable for the tuberculous."

Another conclusion derived from the experience with more than 900 former tuberculosis patients is that it is not feasible to list trades and jobs which are suitable for the tuberculous, but rather to list the factors to be avoided, and those to be sought, in selecting work for such persons.

The book contains a detailed report of this, the only such experiment thus far conducted under the intense, active and natural conditions of work in offices, stores and factories in New York City. The expenses of the experiment were borne jointly by the New York Tuberculosis and Health Association and the Laura Spelman Rockefeller Memorial. Copies are being distributed by the National Tuberculosis Association, 370 Seventh Avenue, New York, N. Y., at 50 cents a copy. There are 1,150 books ready for distribution.

How to Enjoy Health—*Counsels and Maxims for the Healthy Life—By Claude Lillingston, M.D., and Norah Hill, A.R.R.C. With Preface by Sir Squire Sprigge, M.D. London: Hodder and Stoughton,* 1928. 287 pp. Price, $1.00.

This little book is the conjoint work of the well known editor of *The World's Health* and his assistant editor, one a physician and the other not.

The authors state in their preface that they have checked each other's work, Miss Hill having prevented the too great use of technical language and "scientific jargon," and Dr. Lillingston having verified the facts collected by Miss Hill.

There are thirty-seven essays, all of them articles originally published in Red Cross journals, many of which have been translated into several languages. The three characteristics of the book which impress one are accuracy, common sense and humor. It is something of a relief to get away from the cut and dried formula which most books on health follow. The history of the essays already given shows that the book is intended for the public. None the less, physicians and public health workers can read it with pleasure and profit.

The printing is exceptionally good, and the binding, though light, seems adequate for a book of its size.

M. P. RAVENEL

The Home Dietitian—*By Ella Mae Ives (3d ed.)—Philadelphia: David McKay Co.*, 1928. 710 pp. Price, $2.50.

The book is primarily a volume of recipes for all occasions, offering variety and tempting experimentation. However, the title of the book is justified by a few scientific introductory pages to sections written by authorities on diet for adults and children, food classifications and food quantities.

Harvard Health Talks, 9. Pneumonia—*By Frederick Taylor Lord, M.D. (rev. ed.). Cambridge: Harvard University Press, 1929.* 142 pp. Price, $1.00.

Since the first edition, which appeared in 1922, notable advances have been made in the study of pneumonia, particularly in regard to the types of the causative organism and the specific treatment by serum, its uses and its limitations. The refining and concentration methods of Felton are considered.

Written, as it is, by a well-known authority, this new edition is welcome.

M. P. RAVENEL

On the State of the Public Health. *Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1927—London: His Majesty's Stationery Office,* 1928. Price, 2 s. 6 d.

The annual reports of Sir George Newman are in a class by themselves. We look forward to them with eagerness. The present volume strikes us as being even better than its predecessors. Though the material applies particularly to England, the fundamentals are applicable to every part of the world—indeed, there is a section devoted to international health, and there are other chapters on epidemiology, foods and the laws concerning the importation of foods, which are directly international in their character.

While it is hard to select chapters for special mention, we believe those on tuberculosis and the relation of food to health and disease are of particular value. The whole report is written in the clear and convincing style characteristic of the author.

M. P. RAVENEL

Proceedings of the National Conference of Social Work—*Chicago: University of Chicago Press,* 1928. 670 pp. Price, $3.00.

The proceedings of the fifty-fifth annual meeting of social workers held in Memphis, Tenn., May 2–9, 1928, contain an interesting section in health, the papers of this section having been contributed by national figures in the health and social work field. The proceedings are divided into sections dealing with children, delinquents and correction, the family, industrial and economic problems, neighborhood and community life, mental hygiene, organization of social forces, public officials and administration, the immigrant, professional standards and education and educational publicity.

Topical Sources for Personal Hygiene Applied—*By Jesse Feiring Williams, M.D. Philadelphia: Saunders, 1929.* Price, $1.00.

The books on hygiene by Dr. Williams have attained a position which is their just due. This source book, which refers particularly to "Personal Hygiene Applied," will aid teachers in formulating courses and in designating literature for term reports.

The book is well put together, and can be recommended to those engaged in the teaching of hygiene and public health.

M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Anderson County, S. C.—The 1928 report of this county health unit, which serves 80,000 people, indicates that an antidiphtheria campaign reached 3,500 children, while 6,961 typhoid inoculations were given. About 90 per cent of the school population have been vaccinated.

Interest was stimulated in the examination of children of preschool age, and summer round-ups were conducted in four schools. Special written instruction in proper diet and in needed corrections were given the mothers, and each child was given a milk bottle weight tag.

Child health conferences are held, midwives are encouraged to send their patients to prenatal clinics, and classes of instruction are conducted for midwives. Considerable work has been done in health education, through the schools, the press, the county fair and exhibits, including the distribution of nearly 25,000 pieces of health literature.

Kentucky—The December bulletin of the State Board of Health contains an analysis of vital statistics for the state for 1927, including death rate tables for 5 years and birth rate tables for 2 years. A general death rate of 10.8 for 1927 (9.8 for white and 19.8 for colored persons) is recorded. An infant mortality rate of 62.3 in 1927 compares with a rate of 74.5 in 1926. Deaths of children between the ages of 1 to 5 years declined from 2,280 in 1926 to 1,614 in 1927. A birth rate of 24.1 for 1927 is noted. This is an interesting and comprehensive statistical report.

New Hampshire Tuberculosis Association—During 1927, there is reported a tuberculosis rate of 63 per 100,000 population—the lowest recorded for the state. This compares with an average annual rate of 118 in the decade preceding 1917, 89 in 1922 and 66 in 1925. It is gratifying to note that the clinics are gradually dealing with lessening numbers of far advanced cases. "The state-wide clinic, nursing and educational campaigns, the increasing coöperation of the medical profession and the public at large, are resulting in the early discovery of easily curable cases. From our clinic experience we know that the great majority of these cases do not develop into advanced cases, but under prompt treatment are cured."

Among the encouraging factors listed are the steady downward trend in the death rates and in the number of advanced cases, the increases in the number of arrested and cured cases, the widespread interest and sympathy of the people, and the complete state-wide organization of clinic and nursing service. One of the important discouraging factors is the occurrence of acutely active cases of tuberculosis in young people between 15 and 20 years of age, particularly among young women. "That this is due at least in part to under-nutrition is quite evident in some cases."

Connecticut—Another year without marked epidemics, except measles, is noted, and the coöperation shown by the physicians of the state is considered a major factor in control work. By means of leaflets, posters, illustrated lectures, moving pictures and exhibits, the department has endeavored to disseminate information on the promotion of health and prevention of disease. Among the exhibits were those at the State Fair and at the Sesquicentennial Exposition at Philadelphia. Attendance

at film showings numbered 109,062 in 267 places. There were 246 health talks given, with an attendance of 26,159. Including these activities, posters and exhibits, exclusive of leaflets, it is calculated that 212,900 persons were directly reached by the health education service.

The state reports for 1926 a birth rate of 18, a marriage rate of 7.7 and a death rate of 11.4, with a rate from puerperal diseases of 6.4. A special study has been carried out during the past 3 years of 370 diphtheria deaths in the state, or 85 per cent of the total deaths from this cause. During this time, 27.9 per cent of the diphtheria cases were under 5 years of age, but 53.2 per cent of the deaths were in this age group. In 39 per cent of the deaths the doctor was not called until the 4th day or later. None of these fatal cases had been immunized against diphtheria by toxin-antitoxin.

The report indicates that few public health activities have such an appeal as child hygiene.

Three out of every 100 babies born each year are now living who, ten years ago, would have been dead. If these were valued at $1,000 apiece, the profit for the year to health workers in the state may well be termed 866 × $1,000, or $866,000. A rather appreciable dividend to the onlooking world, not to mention the value of this saving to mothers and fathers.

The legislature has recognized the need for public health nursing in the state and passed a bill providing for state aid for these towns so that all towns having average receipts of not over $50,000 for the three fiscal years preceding are now eligible to ask the department for state aid.

What is the dividend in health for 1926? Applying the methods of calculation promulgated by the National Conservation Commission as was first shown in the 1921 and 1922 reports of this department, Connecticut saved $2,734,600 in preventing deaths of persons in the state who would have died if the disease death rates for the average of the years 1915–1919 prevailed today. . . . It would therefore appear certainly safe to say that the savings effected from lessened deaths and lessened cases of disease is at least twice the savings due to lessened mortality. From this it will appear that in the last 5 years there has been a total saving to the state of at least 28 million dollars.—
State Dept. of Health, 42d report for the year ending June 30, 1927.

Kansas—The 14th biennial report of the Kansas State Board of Health, for the period ending July 1, 1928, contains 252 pages of text, statistical and graphic material, including a table of contents at the front and an alphabetical index at the back. This is one of the best state reports of the year from the standpoint of arrangement, use of space and special features. One of the most creditable features is the statistical graphs and charts which have been carefully made and convey a message of progress in results of health work. Another attractive feature is the health posters reproduced from the drawings of high school pupils who engaged in a contest sponsored by the department in 1927 and 1928. The posters were judged by a committee composed of health officers and art editors.

An effective chart shows that about 75 per cent of the infectious disease reports are received during the first 6 months of the year, the season when acute respiratory infections are most prevalent, the highest percentage occurring in March, measles, chicken pox, and scarlet fever being most prevalent. The board of health has adopted the slogan " Diphtheria Must Go," and has instituted an intensive program. According to the Board of Agriculture, there were in 1927, 548,409 persons in the state under 20 years of age. Reported immunizations against diphtheria include 18.8 per cent of this number. Infant mortality has decreased from 87 in 1913 and 75 in 1914, to 54 in 1927.

A school for health officers and public health nurses was held in April, in

1927, and in 1928. These schools were made possible through the coöperation of the U. S. Public Health Service and the Rockefeller Foundation. In addition to the public health group, a number of physicians in private practice attended the majority of the sessions.

United Fruit Company—Abounding in attractive photographs of company hospitals in Costa Rica, Panama, Guatemala, Colombia and Cuba, followed by scientific papers, this 1927 report of 368 pages is worthy of study. Considerable progress is reported in the control of malaria, which is considered a major problem, as about 90 per cent of the sickness in camps was due to this disease. Efforts to destroy mosquito breeding places by filling, draining, and the use of Paris green and oil; treatment measures by the use of quinine; and attempts to destroy mosquitoes by insecticide sprays and other means are described.

Considerable space is given to discussions of different methods of use and dosages of the new drug "plasmochin." The drug is particularly effective in cleaning the peripheral blood of gametocytes, which are the adult sexual forms of malarial parasites that infect mosquitoes. Unfortunately, it occasionally produces toxic symptoms when given in large doses over a prolonged period. The report indicates confidence that its use can be extended to the treatment of camp cases in such doses as to be effective without causing serious results. A reduction of 28 per cent in the number of malaria cases treated in hospitals over the number of the previous year (11,141 cases) is noteworthy.

U. S. Children's Bureau—An enlightening report of 150 pages on the promotion of the welfare and hygiene of maternity and infancy has been prepared for the year ended June 30, 1927. Infant mortality rates for 1927 were lower than for 1926 in 30 of the 33 states for which figures for both years are available. At the close of the fiscal year all the states except three were cooperating under the provisions of the Sheppard-Towner Act, the exceptions being Massachusetts, Connecticut and Illinois. The appropriation under this act has been authorized for the fiscal years 1928 and 1929, and the original act ceases simultaneously with the appropriation on June 30, 1929.

The types of work undertaken in the states under the maternity and infancy act are quite uniformly educational. The personnel of the bureau or division administering the act is determined by the needs of the state and the size of its budget. Physicians, nurses, dentists or dental hygienists and clerks make up the major part of the personnel. Including state directors, 140 physicians on the state staffs gave full-time service. Additional physicians were employed to conduct child health or prenatal conferences and to do special work. For example, it is reported that New York State paid 209 physicians for occasional service.

Public health nurses were on the staff of every state bureau or division, approximately 770 nurses being employed during the year. In 43 states and the Territory of Hawaii, 200,223 infants and preschool children were examined by physicians, or advice as to their care was given by physicians or nurses, and in 34 states 27,377 women were given prenatal advice by physicians or nurses. Dental conferences were reported in 15 states to the number of 1,124, where 27,870 preschool children received advice on the care of their teeth, in addition to 1,664 expectant mothers.

Milbank Memorial Fund—The Milbank Memorial Fund report for the year ending December 31, 1927, is divided into three parts. Part one presents a 5-year review of the results ac-

complished in Cattaraugus County and in Syracuse, a summary of the 1927 grants, and an outline of the studies of the New York Commission on Ventilation. The infant mortality rate in Cattaraugus County has declined about 19 per 1,000 births in 5 years, and decreases are also shown in the age periods from 1 to 35. The mortality reductions have been chiefly in the communicable, respiratory, and digestive diseases, and in diseases of the nervous system. The annual death rate from tuberculosis has steadily declined, especially in the younger age groups. Likewise, in Syracuse, decreases in death rates are most pronounced among the younger ages, especially in regard to the communicable and digestive diseases. Tuberculosis, infant mortality, and diarrhea and enteritis among children under 2 years of age exhibited marked reductions.

The Milbank Memorial Fund appropriated $193,000 in 1927 aside from the $325,000 set aside for the New York Health Demonstrations. Among the enterprises to which grants have been made are the Committee on Cost of Medical Care, the International Conference of Social Work, the National Board of Medical Examiners, New York Association for Improving the Condition of the Poor, and the Judson Health Center. The studies on ventilation set up in 1926 in selected schools in Syracuse and Cattaraugus County were carried forward under the New York Commission on Ventilation. In Syracuse conditions were compared in modern steam heated, mechanically ventilated school buildings with those in old naturally ventilated buildings, with results indicating an advantage in the latter. One-room and two-room rural schools in Cattaraugus County were studied in connection with construction, heating equipment and air conditions in the classrooms.

Part two outlines the Rural Health Demonstration in Cattaraugus County, the Urban Health Demonstration in Syracuse, and the Metropolitan Health Demonstration in the Bellevue-Yorkville District in the city of New York. The year 1927 was the first full year of service on the part of the health center under development by the Bellevue-Yorkville Health Demonstration. However, 49,000 visits were made to the health center by residents of the districts, and 60,000 visits were made to persons living in the district. The following activities are carried on: a baby health station, chest clinics for adults and children, a preschool clinic, a venereal disease clinic for adults, a vaginitis clinic for young girls, a dental clinic, a weekly Mothers' Club, nutrition classes for boys and girls in connection with the chest clinic, and lessons in home hygiene and care of the sick. A study of the tuberculosis nursing service in the area, a survey of prenatal, infant and preschool health activities, and a survey of the nutrition needs of the district have been accomplished during the year, in addition to studies based on the records of medical inspections of 1,445 third grade school children in 1925–1926. Data have also been prepared and a report distributed as a basis for an accident prevention campaign.

Part three of the report is a financial statement of the Milbank Memorial Fund with a list of grants. The report as a whole consists of 109 pages and is well prepared, with an abundance of half-tones, charts and tables. An addendum gives the supervisory and operating organizations and personnel of the three New York Health Demonstrations.

Seattle, Wash.—The 1927 report of the Department of Health and Sanitation of Seattle is a well formed volume of 97 pages, with a good index. Seattle has a total land area of 58.56 sq. mi. and a water area of 35.91 sq. mi. The estimated population for 1927 was 375,300. The crude death rate was

9.51, a decrease of 0.82 over that for 1926, while the infant mortality rate for children under 1 year was 41, the lowest ever recorded in the history of the city. The tuberculosis death rate was 53.5, or 10.2 less than for 1926.

The program of the Child Welfare Division has been broadened along lines designed to reduce the incidence of preventable sickness and deaths among mothers and infants. Medical supervision has been placed under the management of the Seattle Pediatric Society in order that physicians highly trained in the requirements of child life might be brought in attendance at the clinics, a move which led to highly favorable results. Seven child welfare clinics are conducted at strategic points in the city, with an attendance of 5,569; and 11,174 visits were made during the year by child welfare nurses, 875 of which were first visits.

Six hundred and forty-eight cases of tuberculosis were under the observation of visiting nurses at the close of 1927. The visits during the year numbered 5,827, while 3,244 cases attended the tuberculosis clinics. The city's sanatorium, Firlands, averaged 202 cases in 1927. In addition to the care and treatment of patients, the policy at Firlands includes the training of the nursing staff so that better equipped nurses may be sent out into this field. A strong plea is made to remove positions at the sanatorium from the civil service list in order that employment may be given to those patients and ex-patients who are able to use it.

BOOKS RECEIVED

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THE CONSUMER LOOKS AT ADVERTISING. By Paul T. Cherington. New York: Harper, 1928. 196 pp. Price, $2.50.

CORRECTIVE PHYSICAL EDUCATION FOR GROUPS. By Charles L. Lowman, Claire Colestock and Hazel Cooper. New York: Barnes, 1928. 521 pp. Price, $4.50.

PREVENTIVE AND CORRECTIVE PHYSICAL EDUCATION. By George T. Stafford. New York: Barnes, 1928. 328 pp. Price, $3.00.

PNEUMONIA (rev. ed.). By Frederick Taylor Lord. Cambridge: Harvard University Press, 1929. 84 pp. Price, $1.00.

HOWS AND WHYS OF HUMAN BEHAVIOR. By George A. Dorsey. New York: Harper, 1928. 298 pp. Price, $3.50.

READINGS IN PUBLIC OPINION. ITS FORMATION AND CONTROL. Edited by W. Brooke Graves. New York: Appleton, 1928. 1281 pp. Price, $6.00.

PRINCIPLES OF SOCIOLOGY. By Rudolph M. Binder. New York: Prentice-Hall, 1928. 609 pp. Price, $5.00.

SAFETY AND PRODUCTION. REPORT BY AMERICAN ENGINEERING COUNCIL. New York: Harper, 1928. 414 pp. Price, $5.00.

PSYCHOLOGY FOR EXECUTIVES. A STUDY OF HUMAN NATURE IN INDUSTRY. By Elliott Dunlap Smith. New York: Harper, 1928. 262 pp. Price, $3.50.

THE FACTS AGAINST COMPULSORY VACCINATION. By H. B. Anderson. New York: Citizens Medical Reference Bureau, 1929. 127 pp. Price, $1.00.

YOUR HEART AND YOU. By Robert W. Langley. Los Angeles: Wetzel Pub. Co., 1928. 59 pp. Price, $1.50.

SOME PROBLEMS OF LONGEVITY. By Frederick L. Hoffman. New York: Spectator Co., 1928. 180 pp. Price, $6.00.

PROCEEDINGS OF SIXTH ANNUAL SHORT SCHOOL TEXAS ASSOCIATION OF SANITARIANS. Austin: Texas Association of Sanitarians, 1928. 188 pp. Price, $1.00.

MOTHER AND CHILD. ADVICE TO THE YOUNG WIFE AND MOTHER OF TO-DAY. By Mary Lyon. New York: Macmillan, 1928. 215 pp. Price, $2.00.

THE BALANCE OF BIRTHS AND DEATHS. VOLUME I. Western and Northern Europe. By Robert R. Kuczynski. New York: Macmillan, 1928. 140 pp. Price, $2.00.

THE STORY OF MODERN PREVENTIVE MEDICINE. By Sir Arthur Newsholme. Baltimore: Williams & Wilkins, 1929. 295 pp. Price, $4.00.

A DOCTOR'S LETTERS TO EXPECTANT PARENTS. By Frank Howard Richardson. New York: Norton, 1929. 118 pp. Price, $1.75.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

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ANDERSON, V. V. Vocational Guidance and Mental Hygiene of Industry. Canada Lancet, 72, 1: 7 (Jan.), 1929.

Rural Tuberculosis Trends—A summary of recent researches in tuberculosis rates. From 1900 to 1916 the urban rate was twice the rural rate while from 1921 to 1926 it was only half again as high. It is hoped that the Cattaraugus County demonstration will throw some light on the reasons for the difference.

ANON. The Trend of Rural and Urban Tuberculosis Mortality. Milbank Quarterly Bull., 7, 1: 1 (Jan.), 1929.

Puerperal Mortality—A general review of maternal mortality statistics and a discussion of the causes.

BLAND, P. B. Puerperal Morbidity and Mortality. M. J. & Record, 129, 2: 83 (Jan. 16), 1929.

Chlorination of Water—A general discussion of the value of treating potable waters with chlorine and the methods by which the chemical may be added to the various kinds of water supplies.

BUNKER, G. C. The Use of Chlorine in Water Purification. J. A. M. A., 92, 1: 1 (Jan. 5), 1929.

Potency of Cod Liver Oil—The potency of cod liver oil varies inversely with the amount of oil in the liver. Oils may vary a thousand times in value.

HESS, A. F., *et al.* Antirachitic Potency in Relation to Volume of Oil in the Liver of the Cod. J. A. M. A., 92, 3: 226 (Jan. 19), 1929.

Health Publicity—A description of window displays used in drug stores of the Bellevue-Yorkville district.

CANDEE, M. D. Selling Health in Drug Stores. Survey, 61, 8: 487 (Jan. 15), 1929.

Undulant Fever—Serum agglutination tests for *Br. abortus* done on 1,100 specimens of blood taken from patients not suspected of this infection gave 63 positive reactions. The incidence of this condition demands more serious consideration than it has thus far received.

GLORDANO, A. S., and ABELSON, M. *Brucella Abortus* Infection in Man. J. A. M. A., 92, 3: 198 (Jan. 19), 1929.

Oral Typhoid Vaccination—Experiments are reported in which it was found that agglutinins and complement fixing bodies were produced as readily by the oral administration as the subcutaneous injection of typhoid bacterine.

HOFFSTADT, R. E., *et al.* Immunological Studies of Typhoid Vaccination by Mouth. Am. J. Hyg., 9, 1: 1 (Jan.), 1929.

Leprosy—An account of the disposition of cases committed to the Federal leprosarium. During the last fourteen years 48 patients have been discharged, 10 to suffer a relapse and be recommitted.

HOPKINS, R., and DENNEY, O. E. Leprosy in the United States. J. A. M. A., 92, 3: 191 (Jan. 19), 1929.

Epidemic of Poliomyelitis—An analysis of the relation between severity of symptoms and distribution in the 1927 outbreak of poliomyelitis in Massachusetts.

LEGG, A. T. An Analysis of the 1927 Epidemic of Infantile Paralysis in Massachusetts. J. A. M. A., 92, 1: 31 (Jan. 5), 1929.

Cancer and Tuberculosis—A study of a carefully controlled group leads to the conclusion " that there is a definite and marked incompatibility or antagonism between the two diseases, cancer and tuberculosis, of such sort that both occur together at the same time in florid activity in the same individual, only with great rarity."

PEARL, R. Cancer and Tuberculosis. Am. J. Hyg., 1, 9: 97 (Jan.), 1929.

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ROBERTSON, E. C. A Study of the Effect of Various Agents, Chiefly Sunlight, upon the Susceptibility of Rachitic Rats to Infection. Am. J. Hyg., 9, 1: 75 (Jan.), 1929.

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SCHAM, M., and SCHAM, G. The Relation between Malnutrition and Nervousness. Am. J. Dis. Child., 37, 1: 1 (Jan.), 1929.

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STEVENS, F. A., and DOCHEZ, A. R. The Relation of Allergy to Scarlet Fever. New York State J. Med., 29, 1: 22 (Jan. 1), 1929.

Progress in Health Education—A review of the history of the health educational movement and the present status of the work by federal, state and city health departments and the voluntary health agencies. Very good.

TOBEY, J. A. The Development of Popular Health Instruction. Hosp. Soc. Serv., 19, 1: 19 (Jan.), 1929.

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WILLIAMS, L. R., and HILL, A. M. The Public Health Nurse and Tuberculosis. Pub. Health Nurse, 21, 1: 4 (Jan.), 1929.

Vitamin Values of Fats—This paper summarizes the reasons for butter shortage in England and tells of the production of margarines as rich as butter in vitamins A and D reinforced by the addition of fish liver oil.

WILLIAMS, P. N., and MACLENNAN, K. Fatty Foods in Relation to Public Health. J. State Med., 37, 1: 32 (Jan.), 1929.

Posture and Health—The effect of posture on health and efficiency and methods of posture training are discussed.

TALBOT, F. B. Posture, Health and Efficiency. Pub. Health Nurse, 21, 1: 8 (Jan.), 1929.

Anti-tuberculosis Vaccination—Intradermal vaccination with Calmette's vaccine proved efficacious in the writer's experience. The treatment seems too heroic for general acceptance.

WALLGREN, A. Intradermal Vaccinations with BCG Virus. J. A. M. A., 91, 24: 1876 (Dec. 15), 1928.

NEWS FROM THE FIELD

THE MEDICAL COLLEGE OF VIRGINIA

THE Chemical Foundation, Inc., New York, N. Y., has made a grant to the Medical College of Virginia at Richmond to provide for the employment, during a 3-year period, of a full-time expert to enlarge the present program of research in chemistry as related to medicine, surgery and dentistry. The special laboratory for this work will also be enlarged.

OFFICERS ELECTED AT ELEVENTH TEXAS WATER WORKS SHORT SCHOOL

AT the Eleventh Annual Texas Short School for water and sewer plant operators, held January 14–22, at the Agricultural and Mechanical College and at Bryan, Tex., the following officers were reëlected: *President*, J. Z. Martin, Breckenridge; *First Vice-President*, W. H. Deaton, Waco; *Second Vice-President*, Bud A. Randolph, Houston; *Third Vice-President*, L. A. Grimes, Abilene; and *Fourth Vice-President*, J. R. John, Dallas. The following officers were newly elected: *Secretary*, V. M. Ehlers, Austin; *Treasurer*, E. G. Eggert, Austin; and *Editor*, Ella G. White, Austin.

Abilene, Tex., was chosen as headquarters for the next annual meeting.

HEALTH WORKERS OF SOUTH-WESTERN OHIO

AT a meeting of the Health Commissioners of the South-Western District of Ohio, on January 23, it was voted to enlarge the association to include the public health nurses and all health workers of the district. Therefore the name of the association was changed to "Health Workers of South-Western Ohio," and the following were elected officers for the ensuing year: *President*, Dr. Edward Blair, Lebanon; *Vice-President*, Mary Ewalt, Eaton; *Secretary and Treasurer*, Dr. C. J. Baldridge, Hamilton. The next of the quarterly meetings will take place in Greenville, O., April 10.

DR. KAMM RECEIVES AWARD

DR. Oliver Kamm, director of chemical research of Parke, Davis & Company, has been awarded the $1,000 prize by the American Association for the Advancement of Science for the "most noteworthy contribution to science presented at the annual meeting," which was held in New York in January. The award was announced on January 2 and was given in recognition of Dr. Kamm's work in investigation of ductless glands and his isolation of pituitary hormones.

APPROPRIATION FOR INFLUENZA RESEARCH

MILTON J. Rosenau, M.D., Fellow A. P. H. A., of the Harvard University Medical School, has announced an appropriation of $10,000 by the Metropolitan Life Insurance Company for research on influenza and methods of its prevention. Dr. Rosenau is head of this company's influenza commission, other members of which are: Edwin O. Jordan, Ph.D., Treasurer, George W. McCoy, M.D., W. H. Frost, M.D., William H. Park, M.D., and Lee K. Frankel, Ph.D., all Fellows of the A. P. H. A.

MASSACHUSETTS GENERAL HOSPITAL PROJECT

PLANS for the new hospital for people of moderate means are now being put into operation by the Massachusetts General Hospital. The contracts

amount to nearly a million and a half dollars, and the trustees are confident of raising the full amount of the necessary funds.

YELLOW FEVER IN RIO DE JANEIRO

NOT since 1908, when there was a campaign to eradicate yellow fever, has there been an epidemic in Rio de Janeiro, until last year in May when the disease appeared again, although occasional cases occurred in the interim. From May until the beginning of October 108 cases had been reported, according to a review of the situation by Dr. Clementino Fraga, Director General of Public Health of Brazil. The case fatality rate was 55.5 per cent, 33 per cent among Brazilians and 62 per cent among foreigners.

In his report Dr. Fraga states that the disease was in all probability imported from the northern states, "the means of communication of which with the capital are all the time becoming more rapid because of the introduction of aerial navigation and because of the increased maritime intercourse carried on by new lines of fast steamers."

The incidence was much greater among men (82 per cent of cases), especially in the two age groups 15–24 and 25–34 years. Barely 10 per cent of those attacked were under 15 years of age. Foreigners were conspicuously more affected. Ninety per cent of the cases were removed to hospitals and the others were cared for at home. Isolation of reported cases and other preventive measures were applied at the beginning of the outbreak.

Extending through an area of 220 to 275 yards from known or suspected cases, supervision was established and continued for periods of not less than 30 days. At the peak of the epidemic over 175,000 persons submitted daily to medical examination at the hands of 73 physicians, 31 visiting nurses, and 100 fourth and fifth year medical students.

The supervision of mosquito breeding places made it necessary to divide the city into 27 districts, and later the districts were divided into 10 urban and 3 suburban districts. More than 1,800 men were employed to cover the city in weekly house to house visits.

Data secured at the last inspection showed a *Culex* index of 2 per cent, which gave grounds for the conclusion that the *Aedes* index is most reassuring and that yellow fever will be quickly exterminated in Rio de Janeiro.

DR. KOFOID EXPLAINS CANCER FILM

CHARLES A. Kofoid, Ph.D., Fellow A. P. H. A., Professor of Zoölogy at the University of California, assisted in the first public presentation of the Canti Cancer Film, given in San Francisco, January 22, and in Berkeley, January 29, under the auspices of the University of California. Dr. Kofoid explained the film, which traces the the growth of the normal as well as the cancer cells and describes the effect of radium upon them.

A. E. GORMAN GOES TO WALLACE & TIERNAN COMPANY

ARTHUR E. Gorman, Public Health Engineer for the Chicago Sanitary District and formerly Chief Sanitary Engineer, Department of Public Works, Chicago Health Department, has become associated with the Wallace & Tiernan Company on sales promotion work. Mr. Gorman assumed his new duties January 1 and is located at the company's headquarters in Newark, N. J.

For six and a half years Mr. Gorman was connected with the U. S. Public Health Service, as Assistant and Associate Sanitary Engineer. He is a Fellow of the A. P. H. A., and has served as chairman of the Public Health Engineering Section and also as section secretary. He was convention manager of the 57th Annual Meeting of the Association held in Chicago in 1928.

TYPHOID CARRIER IN NEW YORK DISCOVERED BY NURSE

A DISTRICT nurse of the New York City Department of Health detected a typhoid carrier dispensing coffee in a restaurant and immediately reported the case to Commissioner S. H. Wynne, M.D. The Health Commissioner stated that the discovery of George Pappas, the carrier, had undoubtedly averted an outbreak of typhoid fever on the East Side of the city. Pappas, who had been previously warned not to handle foodstuff, was arrested and sent to North Brother Island, after a bacteriological test showed that he is still a carrier.

There are 208 typhoid carriers listed on the books of the New York City Health Department, and in more than 7 years only 2 have violated their paroles. The other violator is now a prisoner on North Brother Island also.

CUYAHOGA FALLS HONORED FOR CLEANLINESS

CUYAHOGA FALLS, O., has been awarded the honor for being the "cleanest city in Ohio" by the General Federation of Women's Clubs of the United States in a contest for conducting the best and most efficient clean-up campaign.

DENVER APPRAISES ITS HEALTH WORK

AT a dinner to which all persons interested in the progress of their community were invited, the Denver Public Health Council arranged a conference dinner January 30, when a report of the appraisal of the public health activities of Denver was given. The topics emphasized in the discussion, apropos of the report, were infant mortality, milk control, diphtheria, tuberculosis, and child health in Denver. The appraisal was made by the Denver Public Health Council assisted by the Committee on Administrative Practice of the American Public Health Association.

FOUNDATION FOR POSITIVE HEALTH

THE name of the Women's Foundation for Health, Inc., has been changed to Foundation for Positive Health, Inc., with headquarters at 370 Seventh Avenue, New York, N. Y. The name has been changed to embrace programs of positive health for both adult men and women. The officers of the Foundation are Martha Tracy, M.D., president; Mary E. Wooley, first vice-president; Lenna L. Meanes, M.D., medical director.

NEW YORK CAMPAIGNS AGAINST DIPHTHERIA

A CAMPAIGN for diphtheria prevention was launched January 11 in New York City, at a luncheon given at the Harvard Club by Thomas W. Lamont of J. P. Morgan & Company, who is coöperating with Health Commissioner S. H. Wynne, M.D., and his newly formed Diphtheria Prevention Commission.

Letters have been sent to physicians of New York asking them to urge their patients who have young children in the family to have the children immunized by the toxin-antitoxin treatment.

These letters to be sent out by the family physician are in the style of a diphtheria warning and bear the seal of the City of New York and of the Medical Society of the county in which the physician resides. The warning is as follows:

> The Department of Health, coöperating with the Medical Society of the County, urges me to write you to have your child protected against diphtheria at once.
>
> It is necessary to have all young children between 9 months and 10 years safeguarded in order that they do not catch this dangerous disease.
>
> Treatment is simple, painless, safe and lasting, and requires a few minutes each time of three visits.
>
> I urge you to bring your child to me without delay so that your child may be protected, and the Health Department's wishes carried out.

Editors and owners of local newspapers and the directors and representatives of several health organizations of the city were guests at the luncheon. The newspaper editors have formed a press club to direct and promote the publicity of the campaign and to popularize this phase of the public health program.

AMOY SEEKS HEALTH

UNDER the above title, a recent article in the *China Medical Journal* describes how the city of Amoy in the southern part of Fukien Province is developing public health work. The city of 2 or 3 square miles, on the Island of Amoy, has a population of over 180,000.

Now, after 5 years of labor, Amoy can boast of a model system of water works which is in excellent running order. The filter beds and ozonating plants are amongst the best in the world, and next to none in the Far East. The reservoir is located among the hills far away from danger of contamination. Even the conservative old gentlemen who make up the Board of Directors are firmly convinced that this pure water supply has saved Amoy from cholera, dysentery and typhoid. They are pleased to report that in spite of opposition on the part of uneducated persons, the financial return on their $1,000,000 investment is already proving to be hopeful.

The article reports on new roads, new settlements, a city park, ponds filled, and the beginnings of a health campaign in coöperation with the Council on Health Education of China.

PERSONALS

CHARLES V. CHAPIN, M.D., former president of the A. P. H. A., was re-elected Superintendent of Health, Providence, R. I., for a term of 3 years. Dr. Chapin has served in this capacity for 45 consecutive years.

DR. W. H. NEWCOMB has resigned as Director of the Morgan County, Ill., Health Department to enter private practice.

DR. F. B. DART has been appointed Health Officer at large of Baltimore, Md., to succeed Dr. Harry Linden, resigned.

DR. W. ALLEN ETHERIDGE, associated with the Baltimore Health Department since 1923, has resigned and his successor as supervisor of dental clinics is Dr. Morris Cramer.

DR. JOSEPH P. FRANKLIN, Director of the Bureau of Communicable Diseases, Baltimore Bureau of Health, has resigned to accept the position of County Health Officer and Deputy State Health Officer for Allegany County, Md.

DR. F. H. JOHNSON, Carrizozo, N. M., has been appointed Health Officer of Lincoln County to succeed Dr. P. M. Shaver, resigned.

DR. T. B. LYON, Raon, N. M., has been appointed Health Officer of Colfax County, N. M., to succeed Dr. H. W. Heymann, resigned.

DR. A. WILLIAM LESCOHIER has been appointed general manager of Parke, Davis and Company. From 1918 until 1925 Dr. Lescohier was in charge of the production of serum, vaccines, antitoxins and other biological products when he was made director of the Department of Experimental Medicine.

DR. JOHN E. MONGER, Director of Health, State Department of Health, Ohio, from 1923 to 1929, has resigned to become managing director of the United States Standard Products Company, which manufactures vaccines, serums and antitoxins.

KATHERINE TUCKER, R.N., has been appointed general director of the National Organization for Public Health Nursing. Miss Tucker has had a wide experience in the public health nursing field and resigned as general

director of the Visiting Nurse Society of Philadelphia where she served from 1916 to 1929, to accept the position with the national organization.

RALPH C. SWEENEY, Assistant Sanitary Engineer, Ohio State Department of Health since 1919, has resigned to become Sanitary Engineer of Toledo.

EDGAR SYDENSTRICKER has resigned from the U. S. Public Health Service where he had charge of statistical investigations, to become Director of Research, Milbank Memorial Fund.

DR. I. C. RIGGIN, Cincinnati, O., has been appointed Executive Secretary of the American Heart Association with headquarters at 370 Seventh Ave., New York, N. Y. Dr. Riggin was formerly Health Commissioner of Lorain County, O., and was Executive Secretary of the Heart Council of Greater Cincinnati during 1928.

DR. ERNEST W. CAVANESS has resigned as Commissioner of Health of Kansas City, Mo.

LOUISE STANLEY, PH.D., Chief of the Bureau of Home Economics, U. S. Department of Agriculture, has been chosen to represent the department on the American Standards Association.

DR. MERRILL E. CHAMPION, who for several years has been Director of the Division of Hygiene of the Massachusetts Department of Public Health, has resigned and is succeeded by Dr. M. Luise Diez of the New York State Department of Health.

DR. ARTHUR S. HARTWELL of Norwood, Mass., has been appointed medical examiner of the first Norfolk district.

DR. ANDREW L. WEST has been appointed Director of Public Health of St. Joseph, Mich.

DR. BRON D. BLACKWELDER has been elected Director of the county health unit at Natchez, Miss.

DR. J. A. JOHNSON has been appointed Health Officer of Olean, N. Y. Dr. Johnson was formerly Health Officer from 1916 to 1922.

DR. WILLIAM R. MAY, Amory, Miss., has been chosen to direct the Lincoln County Health unit.

DR. WILLIAM SCHROEDER, JR., has been appointed head of the Department of Hospitals of Brooklyn, N. Y. This new department is under the guidance of the Department of Health and of the Department of Public Welfare.

DR. THOMAS A. RATLIFF has been reappointed President of the Cincinnati Public Health Federation. Dr. Julien E. Benjamin has been elected Vice-President and Dr. Arthur C. Bachmeyer, Honorary Secretary.

DR. J. FORREST STULTZ has resigned as Health Commissioner of Champaign County, Ohio.

CONFERENCES

April 8–12, 13th Annual Clinical Session of the American College of Physicians, Boston, Mass.

April 22–26, Seventh Annual New England Health Institute, Hartford, Conn.

May 7–8, Association of American Physicians, Atlantic City, N. J.

May 14–17, American Psychiatric Association, Atlanta, Ga.

May 27–31, National Tuberculosis Association, Atlantic City, N. J.

June 13, International Hospital Congress, Atlantic City, N. J.

June 17–21, Annual Convention, American Hospital Association, Atlantic City, N. J.

June 24–28, American Water Works Association, Toronto, Can.

July 8–13, International Council of Nurses, Montreal, Can.

July 13–20, Fortieth Congress and Exhibition of the Royal Sanitary Institute, Sheffield, England.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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The Economics of Medical Service*

W. S. RANKIN, M. D., FELLOW A. P. H. A.

Director, Hospital and Orphan Sections of The Duke Endowment, Charlotte, N. C.

THE recent organization of the Committee on the Cost of Medical Care, representing the different viewpoints of a number of organizations with a kindred interest, emphasizes the timeliness of the present discussion and justifies, to a considerable extent, at least, this brief review of current thought.

In considering the economic factors of any problem, we are concerned with two fundamental conditions: (1) the cost of production, and (2) the purchasing power of the people.

The great majority of people have no direct concern with most of the misfortunes of life, with poverty, with penal institutions, with broken homes, but everyone, sooner or later, meets the problem of disease, the common misfortune of us all. Sickness and impairment constitute á problem so large as to touch every individual life, and so important in our political life as to be a matter of real concern to everyone who has risen to the level of citizenship.

The average individual between the cradle and the grave spends one-fortieth of his time in bed because of incapacitating illness. The average worker loses 2 per cent of his time, a fraction more than 7 days a year, because of incapacitating illness.

One-fortieth of the population is constantly ill to the extent of being bedridden. Extensive and reliable studies indicate that where there is 1 person incapacitated, there are at least 2 physically impaired to the extent of from 10 to 50 per cent of their efficiency, which is to say that for every 1,000 people there are 50 who suffer from prevalent and chronic diseases that completely incapacitate for but a small part

* Read at the Second General Session of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

of their duration, such as tuberculosis, cancers, heart disease, vascular diseases, chronic indigestions, gallstones and kidney stones, hernias, unrepaired injuries following childbirth, etc.

THE COST OF MEDICAL SERVICES

The annual expense to the people of the United States for medical services, if itemized and totalled, would read about as follows:

150,000 physicians, @ $3,000 per annum	$450,000,000
140,000 private duty nurses, @ $1,500 per annum	210,000,000
150,000 practical nurses, @ $1,000 per annum	150,000,000
100,000 attendants, @ $1,000 per annum	100,000,000
50,000 dentists, @ $3,000 per annum	150,000,000
7,000 hospitals, with a total of 860,000 beds	750,000,000
Druggists for medicines	700,000,000
25,000 healers, chiropractors, osteopaths, Christian Scientists, etc., @ $2,000 per annum	50,000,000
Grand Total	$2,560,000,000

The people of the United States, it will be noted, are paying for the treatment of disease not less than $2,500,000,000 a year, or ($2,500,000,000 ÷ 120,000,000 population) $20.83 per capita, or approximately $100 per family.

The average wage-earner's family, according to studies conducted by the U. S. Bureau of Labor Statistics, pays $60.39 a year for medical services. The average farmer's family, according to studies conducted by the U. S. Department of Agriculture, pays $61.60 a year for medical services. The average family represented in the clerical personnel employed by a large insurance company pays $80.00 a year for medical services.

OTHER AND LARGER COSTS OF SICKNESS

In addition to the expense for medical services imposed by disease, there is an estimated annual loss to the people of the United States of $2,000,000,000, as a result of decreased wage-earning capacity. And this is not all—there is a still further loss of permanently interrupted wage-earning capacity through postponable deaths, estimated to be $6,000,000,000, making the total annual cost of disease to the people of this country $2,500,000,000 for medical services, plus $2,000,000,000 loss in wage-earning capacity, plus $6,000,000,000 death losses—a total of $10,000,000,000 a year. The total annual income of the United States is about $90,000,000,000.

THE PURCHASING POWER FOR MEDICAL SERVICES

Any service which costs as much as medical care and which is so absolutely essential to both individual and national prosperity and happiness, raises at once the question of the ability of the people to

pay for it. The income of the people of the United States, according to Leo Wolman, quoted in *The Survey* for June 15, 1927, was as follows:

6 per cent of families, annual income in excess of $2,900
90 per cent of families, annual income under $2,000
67 per cent of families, annual income under $1,450

There is a gap between the cost of medical service and the purchasing power of a large percentage of American families. The width of the gap may be measured to some extent by the percentages of people who are able (1) to pay in full, (2) to pay in part, and (3) to pay nothing for medical care.

According to the U. S. Bureau of the Census, in a study of "Hospitals and Dispensaries" in the United States as of the year 1923, 49.7 per cent of patients treated in general hospitals were able to pay in full; 19.3 per cent of patients paid in part, and 31 per cent of patients paid nothing.

Compared with these institutional payments for the care of the sick, we have no such reliable data as to the percentage of the people who (1) pay in full, (2) pay in part, and (3) pay nothing for the services of physicians. It is reasonable to suppose that if we had such data, we would find the pecuniary relation of patient to physician very similar to that of patient to hospital. It is, therefore, reasonable to assume that approximately 50 per cent of the patients pay their physicians' bills in full, 20 per cent in part, and 30 per cent not at all.

Unquestionably, a large percentage of American people are not receiving the medical care that they should have, both as individuals and as units of society.

The gap between the cost of care and purchasing power is not due entirely to differences between the cost of service and the means for obtaining it. There is another factor in the situation too important not to deserve serious attention.

The expenses of being sick are unanticipated, appearing at unforeseen and irregular times, and are not like the expenses for food, clothing, shelter, etc., anticipated, appearing regularly and paid for in monthly accounts. If a family had its average annual cost for sickness of $60 to $100 a year apportioned and appearing at monthly intervals with the other family expenses, the problem would be met by a much larger percentage of people than can now meet it successfully. All too often the bill for sickness falls upon the victim in annual, biennial, or even quadrennial accumulations. When a family runs along for one, two, or three years, and then has a serious accident or illness, with a hospital bill, professional charges for surgeons and nurses

—an account of $150 to $300—its economic stability is seriously jarred and often shattered. For a large percentage of families—that 50 per cent of American families whose annual income is below $1,200—when the unexpected and accumulated financial burden of sickness arrives, there is, as Dr. Michael M. Davis aptly says, one of these alternatives: medical charity or financial tragedy. It is, then, not the amount, so much as the condition of payment of the account with disease, that rips the family purse.

How can buckle and tongue be made to meet? What treatment will improve or relieve this social abnormality? What remedies may be considered?

Is an attack from both sides of the problem, designed on the one hand to lower the cost of medical service and on the other to improve the purchasing power of the public for obtaining medical service, possible? Is such an attack practicable? Let us deal with the two questions separately.

CAN THE COST OF MEDICAL SERVICE BE LOWERED?

There are two ways generally conceded for lowering the cost of medical care. One way is by the prevention of unnecessary disease, and the other way is through the use of an organized medical service.

Prevention—A bare statement of the principle of the economy of prevention versus cure is quite sufficient. Illustration and arguments are unnecessary.

Improved Medical Service—A skillful physician costs the patient less than an unskillful physician. His diagnosis is more complete and accurate, his treatment more efficacious, the number of visits necessary fewer, and the cure more permanent.

An organized medical service, that is, a medical service in which the several more important branches of medicine are properly articulated, a service that consists of a group of physicians, a pediatrician, several general practitioners, an obstetrician, an X-ray and laboratory worker, and one or more nurses, is many times better able to diagnose and treat disease than an unorganized service consisting of physicians and specialists without any well conceived coöperative plan of work. Such an organized, well rounded, inclusive medical service lowers the cost of illness by shortening the period of time and decreasing the number of visits necessary for treatment, and affording a more certain and permanent recovery. But this is not the only advantage.

An organized medical service can be offered for financial returns considerably smaller than the cost would be if the patient obtained the same service from unrelated practitioners and specialists. An or-

ganized service makes possible economies which are not possible in an unorganized service. In an organized service less office space is needed than would be the case if the same number of physicians were working separately; economies in equipment are possible, one X-ray outfit, one laboratory, one set of obstetrical instruments, one set of sterilizers, serving where otherwise a multiplication of equipment would be needed; economies in personnel are possible, one bookkeeper, one collector, one nurse, one technician, where otherwise several would be needed.

A few examples of the efficiency combined with the economy of organized medical services will illustrate and substantiate the above statements.

The Cornell Clinic—The efficiency of the Cornell Clinic is attested by the fact that 3,500 physicians in the City of New York and its environs have referred 12,000 patients to the clinic in the last 6 years, and further, by the fact that 130,000 visits a year are made to the clinic by 21,000 patients; moreover, its attendance is constantly growing. The character of its professional work is, so far as the writer knows, not questioned.

The economy of the clinic is indicated in the ranges of its charges, the charges varying from $1.60 to $5.00 per visit, the average visit costing $2.39.

Harry H. Moore,[1] referring to the economy available through the Cornell Clinic, says:

> It is illuminating to compare charges made by the Cornell Clinic for an entire sickness or disability with charges made in private practice. A patient with a fracture of the lower arm pays at the Cornell Clinic for complete treatment, including X-ray, baking, and massage and 12 visits to the clinic, an average of $37.50. A moderate private rate for the same services is $100.
>
> The cost of service to 80 patients of the Cornell Clinic, many of them still under treatment, selected consecutively so as to include a variety of disease conditions, was ascertained to be $522.40. It was then found that the same services, if given by a general practitioner charging a minimum office fee, would have cost these 80 patients $1,182, and that if given by recognized specialists with medicine, X-ray and laboratory tests, they would have cost them $2,595.

Certain Universities—Through an organized medical service, some of our larger universities, notably the University of Michigan, the University of Minnesota, and the University of California, are able to render a thoroughly modern medical service, including hospital care, to their students for from $9 to $12 per student a year. It is admitted, of course, that the sickness liability of university students is considerably less than that of the general population.

The Endicott-Johnson Corporation—Its 16,000 employes and their

families represent a total population of probably not less than 60,000 people. The corporation gives to this group of employes and their families a medical service which includes the full-time services of 27 physicians, 3 dentists, 1 X-ray technician, 51 nurses, and 2 pharmacists, for an annual cost of $25 per worker, or at a cost of $6 to $7 per capita for the whole industrial population.

Roanoke Rapids, N. C.—This industrial settlement, composed of the workers of 5 cotton mills and 1 paper mill, gives a very modern, efficient medical service, including hospital care, home visits, and public health nursing, for $23.60 per family, or at approximately $9 per capita.

That the professional work of these organized services, as compared with that of unorganized services, is of a very high order, will be everywhere admitted. The leaders of the profession identify themselves with group practice, i.e., with organized medicine. When sick individually or when their families are sick, they resort to the use of an organized service. It is more efficient; it is more economical.

The merit and the future of organized medical services are indicated in the development of clinics. In 1900 there were 150 clinics in this country; now there are more than 5,000 in operation.

Unquestionably, one way to lower the cost of medical care is by improving the character of the medical service, and the first step in this direction is the establishment of a proper relationship between various medical specialties. The figures with reference to the development of group clinics are encouraging and indicate that professional leadership is handling this problem expeditiously and is not in any great need of outside assistance.

CAN THE PURCHASING POWER OF THE PUBLIC BE IMPROVED?

The point has already been made that if the average annual cost of disease and accident per family were evenly distributed over the months and years, it could and would be paid by many who, under present conditions, are unable to meet it.

A remedy for other large and unanticipated losses, which bring with them serious financial problems, has been found. In the unanticipated loss of the family of financial support by death, in the unanticipated loss of a man's business by fire, in the unanticipated liabilities of estates through accidents and suits, we take advantage of the insurance principle. The insurance principle avoids unanticipated and serious financial losses by anticipating and apportioning them over long periods of time and over large groups of the people. Total burdens that crush are borne easily when divided.

Roanoke Rapids is a splendid example of the application of the insurance principle in the anticipation and apportionment over many weeks and large numbers of people of the cost of sickness. The mill worker takes care of his family by the weekly payment of 25 cents, and so avoids an otherwise annual, biennial, or triennial bill of from $60 to $100 for medical care.

Another interesting example of the application of this principle is that of the Radcliffe Infirmary, a county hospital of Oxford, England. Under the plan in operation there, a family consisting of a man and his wife and children under 14 years of age, whose family income does not exceed $1,265 a year, receives both in-patient and out-patient service for a payment of 4 d., or 9.2 cents a week. For children between 14 and 19 years of age, an additional payment of 1 d., or 2⅓ cents a week, is required.

The insurance principle, as exemplified in the work of Roanoke Rapids and in the work of the Radcliffe Infirmary and County Hospital, appears to be the only remedy, but a most effective one for providing adequate medical care for a very large percentage of the people. Only a beginning has been made in its application. It is worthy of more extensive adoption and, unquestionably, we shall see in the near future an extended application. The development of sickness insurance is likely to be, in its early stages, in small and isolated groups. It holds out a strong appeal to industrial groups such as that at Roanoke Rapids. Its availability to agricultural groups will probably follow a more extensive use of the principle used in the industrial centers. As its use becomes more extensive and its value more generally recognized, we may expect to see the large insurance companies embrace it as a part of their protective program.

REFERENCE

1. Moore, Harry H. *American Medicine and the People's Health*, pp. 229–230.

Cyanogen Products used in Fumigation

THE use of poisonous cyanogen products for fumigation has increased during the past few years. They are largely used in the fumigation of vessels arriving from foreign countries, since they are powerful agents for the destruction of rodents and insects which may be carriers of disease.

Unfortunately some fatal accidents have occurred, not only on land, but also on vessels undergoing fumigation. The U. S. Public Health Service now advises the addition to these poisonous gases of enough tear gas to serve as a warning agent. The adoption of this measure will go far toward preventing such accidents in the future as have occurred in the past.

Skin Irritants*

CONSTANTLY increasing attention is being given to dermatitis as an industrial hazard and a greater number of cases are being reported, attributed to an ever growing number of irritants. In England, W. J. O'Donovan says that the question of invalidity due to occupational diseases of the skin is so great and so important that it deserves the investigation of nothing less than a special commission. Beintker regrets that in Germany industrial eczemas are not included as occupational diseases in the sense of the ordinance regarding the extension of accident insurance to industrial diseases, as the worker is often seriously handicapped in his earning capacity thereby.

In England compensation for industrial dermatitis has been in effect since 1918, and the yearly reports of the Chief Inspector of Factories show the increasing importance attached to this subject by the Home Office.

In this country, Ohio has required the compensation of cases of occupational dermatitis since 1921, but most of our states do not as yet require even the reporting of industrial skin affections. Realizing the growing importance of this subject and the lack of generally distributed information thereon, the Industrial Hygiene Division of the U. S. Public Health Service is conducting research on occupational dermatitis, but has not yet published a report.

This report reviews the literature on the subject from 1925 to 1928 and endeavors to classify and correlate it. Several general discussions appearing in 1926 will be considered, but specific references to case reports will be given only from the later part of 1926 to 1928.

CLASSIFICATION

Otto Sachs classified occupational dermatoses as follows:

Occupational Stigmata, as pigmentation, bronzing, scar formations and callouses
Caloric effects
Involvement of sweat and sebaceous glands, endogenous or exogenous in origin
Occupational nail diseases, as from arsenic, indigo, etc., or as in laundresses
Trade Toxicodermata; acute in form
Trade Eczemas, localized, chronic and relapsing
Dyes
Electric burns, X-rays and radium
Infections
Carcinomatogenous action, as from tar products

* Report of the Committee, presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

R. Prosser White classifies skin irritants on their chemical or physical nature and mode of action, as follows:

1. Mechanical or Physical Agents
2. Detergents, as warm water, soaps, etc., and all substances which emulsify skin lipoids
3. Anhydrides and Desiccators. Hygroscopic agents suck up water and generate heat in forming acids
4. Hydrolizers, as phosphorus, phosgene, mustard, etc.
5. Keratin Solvents, as sulfides, alkalies, etc.
6. Protein Precipitants, as heavy metal salts, formaldehyde, tannic, picric and carbolic acids
7. Oxidizers, as chlorine, chrome, etc.
8. Reducers, as tar, salicylic acid, arsenious acid, and paraphenyldiamine, etc.
9. Agents liberating acids from salts or from toxic nitro derivatives, as T.N.T. dinitrophenol, etc.
10. Keratonic or Neoplastic Agents, as arsenic, wood distillates, coal distillates, etc.
11. Biotic Agents, as vegetable, animal or microbic parasites
12. Sensitizers-Anaphylactoid, chemical, as mustard gas, benzene, etc., or vegetable, as various plant oleoresins, etc.
13. Anaphylactic agents, as vegetable or animal proteins

Foerster says that Lane has proposed the term "Dermatitis Industrialis" to be followed by qualifying adjectives such as "venenata," "eczema," etc., and an occupational term. He makes a plea, as does Lane himself, for more accurate detailed records of cases of industrial skin lesions. He uses Oppenheim's 3 groups of cases of industrial dermatoses.

1. Toxicodermias, with sudden onset following minimal exposures, and with progression after exposure ceases
2. Circumscribed occupational dermatitis following prolonged action of irritants on normal skin and improving on removal of irritant exposure. (They may at times be due to temporary increase of hypersensitivity or to increase in the strength or activity of the irritant.)
3. Occupational Eczema, dermatitis occurring in a sensitized or allergic skin with tendency to persist, to progress and to show exacerbations

DIAGNOSIS

White emphasizes some of the diagnostic difficulties met with in the study of dermatitis occurring in workers and presumably due to occupation.

A primarily internally produced skin disease may be mistaken for its traumatic counterpart. Has the patient a congenitally normal skin? Is the agent blamed a true causative agent? Does the irritant produce sensitization?

Otto Sachs states that blondes and old persons are especially susceptible to skin inflammations and various writers emphasize the special sensitiveness of very dry or very moist skins.

O'Donovan states that the reaction to external irritants depends largely on the skin rather than the influences. He devotes an entire paper to the psychologic factor in dermatitis. He states that an acute dermatitis venenata may become chronic if there is any hereditary trouble, mentioning, among the factors making for chronicity, chronic

urticaria, cheiropompholyx, congenital ichthyosis and a neuropathic taint. He states that psychic injury, emotional stress, nerve strain, anxiety, even greed and laziness, may be the most potent factors in educing and continuing a cutaneous disorder. This theory must influence diagnosis, treatment, handling and reporting of cases that are concerned in workmen's compensation acts. He gives case histories to support this statement.

Among etiologic difficulties he lists ignorance of the real nature of the substances being used by the worker and the fact that names of occupations do not always indicate the character of the exposure. Workers are often exposed to a variety of potentially irritating substances, and personal susceptibilities vary greatly to specific irritants.

Rost states that all possible exposures should be considered, and idiosyncrasy, seborrhea, or the presence of interdigital fungus infection must be excluded before a diagnosis of occupational dermatitis is made. Due to general or constitutional conditions, an acute trade dermatitis may become a chronic eczema or a preëxisting eczema may be covered by a dermatitis venenata. A congenital tendency to eczema may only develop late in life.

Various writers state that predisposition is essential for the development of an occupational eczema. The individual may be truly idiosyncratic, reacting at once, or only after sensitization following long or frequent contact, or only to the most violent irritants or caustics.

The most complete summary of the diagnostic factors in the consideration of occupational dermatitis was found in mimeographed lecture notes given by Dr. J. H. Stokes to medical students at the University of Pennsylvania.

Occupational dermatitis is due to an occupational irritant contact on a predisposed background. It may come on for the first time months or years after the patient first began work with the irritating substances. The tendency is to exaggerate the occupational factor and overlook the background presented by the patient.

Seborrhea, overwork, ichthyosis and nervous stress, the involution factors of late middle life, and pyogenic infection, both focal and local, are the chief predisposing influences. The last factor may be present in one or more workers in a plant, and be responsible for apparently severe irritations by a material not found to be especially irritating to other groups in other plants. The same may be true of the epidermophyton infections of hands and genitalia which are the conditions most generally confused with occupational dermatitis. The test of an occupational factor is usually, but not invariably, involvement of ex-

posed parts, improvement or recovery upon withdrawal from work, change of residence or careful protection of the affected parts, with relapse when exposure is resumed. If recovery does not occur on the institution of comparatively simple measures combined with withdrawal from exposure, some complicating general factor may usually be assumed. Additional important considerations include excitation of dermatitis by minute amounts of the toxic substance, frequent pyogenic complications and signs of autoinoculability.

Again, Sachs states that trade toxicodermata or acute dermatitis, usually self-limited and healing on removal of exposure, may blend into localized chronic and relapsing trade eczemas, characterized by general specific predispositions and developing on continuation of exposures. Sensitivity is seen in intense irritation, spreading and difficult healing. There are 4 steps to development of this type: (1) A specific inherited sensitivity, (2) resistant skin with little or no immediate response to irritants, (3) development of slight inflammation and accustoming to the irritants, (4) increasing of irritant exposure beyond the limit of accustoming. The nature of the irritant, the duration of the exposure and the concentration of the irritant play important parts.

Lane, in discussing the importance of definite standards in industrial dermatology, states that the first essential in consideration of a case is a reliable detailed history. Under working history he asks for previous occupations, length of time with present firm and on present job, details of process, of substances handled and of cleansing methods at home and in the factory, recent changes in working process or in cleansing methods, other workers affected, and other work done by the patient.

He gives as the essentials for the diagnosis of occupational dermatitis: (1) Amelioration on freedom from contact with suspected substance, and repeated attacks on new exposures, (2) lesions consistent with a history of exposure to the suspected substance, (3) exposure to substances known frequently to produce skin changes, (4) location of lesions (hands most frequent), (5) lack of evidence of exposure to other irritants, and (6) typical lesions.

For purposes of classification he makes 4 groups:

1. Definitely industrial
2. Probably industrial; a less clear-cut relation, a less irritating agent or less characteristic lesions or examination only a long time after onset
3. Doubtfully or possibly industrial
4. Definitely non-industrial

Mori discusses idiosyncrasy and anaphylaxis in relation to industrial diseases.

1. Anaphylaxis differs from idiosyncrasy, although in the case of certain agents the distinction between the two is not so clearly drawn as the following would seem to indicate.

2. Anaphylaxis is due to a proteid or a colloid substance; has a definite period of incubation; shows Pirquet's phenomena; and may be transmitted passively. Idiosyncrasy may be due to crystalloids; has no period of incubation; does not show Pirquet's phenomena; and is not transmitted passively.

3. The persons affected are apt to be: field laborers, horticulturists, gardeners, florists, wood-workers, milkers, bakers, etc.; herdsmen, workers around animals, furriers, hatters, textile workers, dyers, workers in brushes, horsehair, etc.; workers in gold, chemists, pharmacists, etc.; varnishers.

4. The symptoms are found in the skin and mucous membranes, the respiratory and circulatory systems, the blood and the serum. The nervous mechanisms are also involved. Local reactions due to contact with the offending substance also occur. Skin disturbances may include gangrene. Menstruation may be affected.

5. The differential diagnosis can readily be made by the uniform character of the symptoms and their sudden onset; the appearance of the reaction when the skin is treated with the offending substance in alcoholic solution, its appearance when the patient comes into contact with the offending substance, and its transmissibility.

6. The author reports 3 cases, 2 of erythema of the face with intense conjunctival hyperemia due to dry hay, and 1 of dermatitis due to vegetable sources.

7. The disease may be regarded as occupational, and hence has medico-legal significance.

Perutz discusses the relation of idiosyncrasy to allergic skin diseases.

STATISTICAL DATA

As an indication of the importance of dermatitis as an occupational hazard, several reports given in the literature are of interest.

Parmenter and Dubreuilk report 532 dermatologic cases seen at the industrial clinic in the Massachusetts General Hospital, or 1 case in 9 of the total. One-third of these were diagnosed as dermatitis or eczema, 147 being recognized as of industrial origin. There were 21 cases of epidermophytosis. Of the 147 cases of industrial origin, 86 had been exposed to the irritant substance for less than 9 months.

E. Weil reports 144 cases of occupational eczema, 25 of which were due to crude oil, 20 to alkalies, 19 to salts, 18 to tar derivatives, 15 to acids, 14 to physical agents, 9 to varnishes or lacquers, 9 to other organic agents, 8 were anaphylactic reactions, 4 each due to metals, alkaloids and living excitants and 3 to metalloids. These total 152; so there must have been some cases attributed to more than one of the above agents.

The 1926 *Annual Report of the Chief Inspector of Factories for Great Britain* lists 55 cases of chrome irritations and 187 malignant ulcerations due to the distillation products of coal and petroleum, with 49 deaths. In 1924 there were reported 429 cases of industrial derma-

titis, 61 from baking, confectionery and biscuit making, 28 from creaming and icing in the biscuit industry, and 52 due to alkalies. Among painters in one plant, 21 per cent were affected by dermatitis attributed to American steam distilled turpentine.

The *Occupational Disease Reports of Ohio for 1925–1926*, obtained through Emery R. Hayhurst, M.D., show 932 such cases, 75 of them possibly attributable to paints or paint materials and the balance from rubber factories. A careful analysis of these cases shows 29.3 per cent traceable to steam distilled turpentine, 28.1 per cent possibly to other turpentine, 20 per cent to naphtha, gasoline, etc., 11.8 per cent to "Turpo," "Varnoline," lacquer thinners or dopes, 2.7 per cent to oil and 8 per cent to other irritants. In the first half of 1926–1927 there were 20 cases of possible paint dermatitis reported, 2 from steam distilled turpentine, 3 from gum spirits turpentine and 9 from other paint solvents or diluents.

Foerster, referring to the per cent of occupational dermatitis among all skin diseases, quotes the following figures: Fordyce 2 per cent, Lane 10 per cent, Knowles 16 per cent, Oppenheim and Hazen both 20 per cent and R. P. White 25 per cent.

TREATMENT

Little that is new has been reported as to treatment of industrial dermatitis, but emphasis is laid on complete removal of exposure to the irritant, treatment of the general condition, and on mild applications.

Rost gives an excellent outline of treatment of industrial dermatitis.

Saffores reports excellent results from the injection of autogenous serum in cases of chronic occupational eczema.

TRADE DERMATOSES

In analyzing the reports of specific skin irritations in industry, we have grouped them under various headings which will be discussed one at a time. They are listed in the bibliography under these headings but not all of the articles will be considered in the text.

Kavelerow and Kogan report changes in the skin and nails in female glaze pourers and designers in porcelain and fine pottery factories, in the first group apparently due to the mechanical irritation of the finely ground glaze, and in the second an acute turpentine dermatitis with fissures and ulcerations. The latter cleared up when the women were forbidden to wash the molds with turpentine.

Carey P. McCord in 1925 called attention to cases of dermatitis in painters, etc., due to steam distilled turpentine, similar to those previously referred to in the English report. He listed a large number of possible irritants which might be

found in this product and not in gum spirits turpentine, and surmised that the increased irritation of this product might be removed by careful fractionation. His work indicated the greater irritation of steam distilled turpentines over gum spirit or destructively distilled turpentines, but did not identify the irritating factor. As a result of his report the Industrial Conservancy Laboratories made an intensive study of the problem, but did not complete the work. The Smyth Laboratory has been working on this problem for the producers off and on for two years, and is almost ready to present a final report and publish results. The clinical features, pathogenesis and treatment of turpentine dermatitis are discussed at length by Perutz.

Arzt discusses the skin affections found in agrarian workers, laying particular stress on the occurrence of fungus infections of various types, especially trichophytic, microsporon and favus, also mentioning actinomycosis and swine erysipelas, verrucose tubercles, anthrax, skin parasites, irritation from chemical fertilizers and from thermic extremes. Also he discusses plant dermatosis such as rhus and ivy. He reports an outbreak of infectious granuloma in milk handlers in Switzerland proved to be a staphylococcus infection.

Jordan reports skin lesions in a large group of post and telegraph employes in Moscow. Of 697 employes examined, 326 had skin injuries, 157 ulcers, 16 eczema, 15 warts, and 8 fissures. Of 927 employes visiting the dispensary, 225 had eczema, mostly not occupational, but 37 eczemas were considered occupational, often due to the spreading of paste with the fingers.

The British Home Office in 1927 issued a Welfare Order applying to bake houses with a cautionary note as to the prevention and cure of bakers' itch, emphasizing the importance of thorough cleansing of the entire forearm after work.

Foa reports eczema in tomato peelers in Italy which he attributes to either citric or malic acid in the tomatoes.

Cleveland reports dermatitis venenata in the rubber tire industry due to hexa-nitrodiphenylamine. The Ohio reports indicate that there are a number of irritating substances used in this industry.

Stern in discussing bakers' eczema in Germany says that the flour is not responsible and that, strictly speaking, it is not an industrial eczema.

Starobinski reports a case of vesicular dermatitis in a bread baker due to an unidentified fungus.

Klebanov and Emden report excoriations on the fingers and erosions of the nails in workers in Russian tanneries due to combined mechanical and chemical action in the handling of wet skins and exposure to tan liquor.

Wasserman, *et al.*, report industrial dermatitis from a clinic for glue factory workers.

Klebanov, *et al.*, discuss skin diseases among workers and employes of a basic chemical industry. This paper also has not been reviewed, nor has one on printer's eczema from washing fluids by Seitz.

PHYSICAL IRRITANTS

But two papers specifically discussing physical factors responsible for skin irritation have been noted. That by Weill discusses a case of hyperpigmentation due to continued heat exposure in a rolling mill employe. He suggests a hypofunction of the suprarenals due to heat. Goff notes that skin moisture encourages the development of pyogenic infections.

FUNGI

Blaisdell discusses epidermophytosis as industrial disease. Its importance has already been noted several times in this report. He states that in Massachusetts fungus infections following a dermatitis venenata or eczema may be compensable. He divides the epidermophytoses into 3 groups:

1. Intertriginous—eczema marginata
2. Hyperkeratotic—thickenings of soles and palms
3. Vesicular—on hands and digits

The third group is most interesting to industrial physicians.

Pijper reports 14 cases of sporotrichosis among South African native miners due to Rhinoclaudium Beurmanni, the pathogenesis of which was confirmed by animal experiments.

PLANT PRODUCTS

Among plant products, other than turpentine, already discussed, cashew nuts, Chinese lacquer, teakwood, linseed oil, flax, macassar wood, and tobacco leaves have been incriminated in various papers, and Touton offers a general discussion of dermatitis caused by plants and plant products. He makes 3 groups of subjects: those generally sensitive due to idiosyncrasy, those becoming sensitized by frequent handling, and those remaining immune. In addition to phytogenic dermatitis he discusses cases of pseudophytogenic dermatitis really due to plant parasites, as fungi or animal parasites.

Vokoun finds linseed oil dermatitis, particularly from the handling of South American seed, and suspects foreign seeds as the cause.

D'Agostino traced the flax workers' dermatitis to wild camomile in the fields.

ANIMAL IRRITANTS

Two papers discuss animal irritants. Klauder, *et al.*, report a severe erysipeloid among commercial fishermen along the northern New Jersey coast due to infection with swine erysipelas bacilli, and Vedrov gives data on industrial dermatosis of cocoon winders.

INORGANIC IRRITANTS

Among inorganic irritants, chrome, sulphuric acid, nickel, rock salt, alkali and chlorine are mentioned.

Forster discusses protection of workers in chromium plating establishments in the *International Labor Office Studies*, and Blair reports 12 cases of chrome ulcers in chrome plating plants. He uses 5 per cent sodium hyposulphite to neutralize the acid on the hands.

Schwartz reports skin erosion and irritation of the air passages in men cleaning boilers that had been fired with a petroleum by-product, the sulphur content of which oxidizes to sulphuric acid during firing and settles in the flues.

In discussing so-called nickel rash, Kolzoff reports on the examination of workers in galvanoplastic nickel workrooms in Leningrad. He states that nickel only acts on skin dried by exposure in preparing the metal for nickeling.

Cabot reports an interesting case of recurrent subacute occupational dermatitis due to caustic originally, but at times aggravated or made to recur by heat and by mechanical irritation.

Thurber reports furunculosis in handlers of rock salt in ice cream factories, the salt irritation being responsible for the chronicity.

Telcky reports acne from chlorine in industrial plants.

ORGANIC IRRITANTS

Among organic irritants not previously mentioned we find references to oil, creosote, tar products, para-yellow, aniline pencils and calcium cyanide.

Freund reports a case of melanoderma toxica lichenoides et bullosa in an Italian worker exposed for several months to the fumes of melting tar. He had previously reported a similar case.

Three writers report melanosis or Riehl's disease in workers in mineral oil. Sezary, *et al.*, report follicular hyperkeratosis, oil papules and melanosis in a metal lathe worker. Ravaut, *et al.*, report follicular keratosis and melanosis in a polisher in a piano factory using machine oil, and Chentov discusses professional tatooing in workers in oil mills.

Hudelo also reports a melanosis in a railroad grade worker handling creosoted ties, and suggests the possibility that the creosote contains substances which enter the blood and are photodynamic.

Ravaut also reports a case of oil acne and keratosis becoming cancerous in a worker in an automobile factory handling gasoline and oil. The lesions began 2 months after starting work.

Tarneaud reports occupational sebaceous folliculitis of the nose among greasers of metal parts, one working under a continuous jet of oil.

In *Archives of Dermatology and Syphilis,* a case is reported for diagnosis of a dermatitis of the forearm starting as an erythematous papule and becoming macular and exfoliative, resembling seborrheic dermatitis. There were also lesions in the fauces and large auxiliary lymph nodes. The subject was an oil station employe.

Magee, in the *Journal of the American Medical Association,* reports dermatitis due to para-yellow, probably para-nitro aniline, and Casozza reports erythema, urticaria, eczematoid and bullous dermatitis with general symptoms from calcium cyanide used as a powder in agriculture in Italy.

Iselin reports cases of necrosis of the hand from injuries with anilin pencils.

Oliver reports 15 cases of dermatitis in rotogravure workers attributed to para-nitranilin-red, or a derivative thereof, used as coloring matter in ink.

CARCINOGENIC SUBSTANCES

A consideration of skin irritants must include not only such substances as produce acute or sub-acute inflammatory reactions but also keratogenic agents, and others that act slowly, eventually producing precancerous and cancerous conditions.

The subject of trade cancers is well handled in a paper by R. Prosser White. He states that specificity must be present in an agent before it can initiate a cancer. Such agents are generally keratogenic. Acute cancer developing before the healing of a trauma is rare and probably incidental. There are but few cases recorded of cancer following burns or scalds, and only limited lists available of latent cancer developing at the site of an old scar. Cancers formerly attributed to radiant heat are now thought to be due to the action of ultra-violet rays. Arsenic is the only inorganic substance against which there is conclusive evidence. Distillation products of vegetable matter, whether coal or tobacco, appear to possess carcinogenic properties. A biologic precancerous stage precedes a local cancer. Apart from the agent there must be a cancerous state, liability, constitution or disposition, either general or cellular.

Roussy and Heraux give an extended resumé of the occupational cancer problem, discussing cancer development in eight industrial groups.

Chimney sweeps' cancer seems more prevalent in England than elsewhere and

is attributed to soot formed from improper combustion. The scrotum is the usual primary seat due to the thin epidermis and numerous sebaceous glands. The testicles and penis are involved secondarily by the development of benign papillomatous cutaneous lesions. These cases are similar in origin to cancer cases reported in women working in coal, to that of a gardener using soot and developing cancer on the back of his hand, and eyelid cancers among coal carriers.

English statistics are quoted showing in 1880–1882, 242 chimney sweeps with 49 developing cancer (202 per 1,000); in 1884–1890, 156 deaths per 1,000 of chimney sweeps from cancer; in 1900–1902, 133 deaths per 1,000 from this condition—a gradual decrease.

A paper by Bang covers the same ground.

Roussy considers cancer of tar and pitch workers. Workers with oily tar are apt to develop scrotal cancer while pitch workers are affected on the facial areas, more seldom on the limbs and trunk. The tumors are usually epitheliomata of spinocellular type and occur after long exposure to tar. Workers in paraffine may develop skin cancer after long exposures (25 to 30 years), usually first as squamous papillomata, later ulcerating and in some cases becoming malignant. Leitch is quoted as having produced paraffine cancer experimentally in mice. Textile workers' cancer, reported most frequently as scrotal cancer of mule-spinners, has been quite frequent in England, but rare in America. Until recently it was attributed to oil spraying on the workers' overalls and to pressure on the parts aided by heat during work. Leitch has produced cancer in 30 out of 75 mice treated with oils, the heavy, less refined oils used for greasing and lubricating being active. Cancer is at times met with in petroleum refiners, but not so frequently as in the above mentioned groups. Of 260 scrotal cancers in England from 1913 to 1923, the majority were in chimney sweeps, textile workers, tar workers and oil workers. The last group considered are cancers due to X-rays or radium, also occupational cancers but not usually industrial.

In addition to these general discussions various case reports and discussions of cancer in specific groups have appeared.

Bordier discusses radiologists' cancer.

Stoel claims good results from the use of radium on experimental tar cancer in animals, stating that the rays kill cancer cells sooner than non-cancerous.

Bordier has cured Roentgen ray cancer by diathermocoagulation.

Sherber reports the case of a man, 55 years old, employed in moistening animal hair with spindle oil who developed on his hands, forearms, and a little on the face, an efflorescence, irregular intense reddening, epidermal thickening and scaling, with later formation of horny epithelium, the formation of a kroner sized tumor, centrally ulcerated, on the right thumb metacarpal; rapid ulceration, glandular swelling and active connective tissue inflammation. The tumor proved to be a squamous epithelioma. He states that Bloch and Widmer obtained by vacuum distillation at 230° C. a high molecular cyclic hydrocarbon that was carcinogenic. He feels that there is no one specific carcinogenic substance but that various irritants may so act on predisposed tissue.

O'Donovan reports the development of multiple skin cancers in a gunsmith who had cleaned guns for 39 years with Rangoon and other paraffine oils, his clothing being usually oil soaked. Fifteen horny celled squamous epitheliomata were removed.

Spitzer reports multiple primary paraffine carcinomata in a 44-year-old worker in a mineral oil refinery, extracting paraffine from crude oil residue, and coming in

contact with soft oil cakes. His face and hands were oil spattered and his clothing saturated. He believes that empyreumatic materials in crude oil are the chief causes of paraffine itch and paraffine cancer. No skin diseases are traceable to handling pure paraffine in candle factories.

Lazzarini reports 6 cases of skin cancer among coal workers, 1 case in a coal-tar worker in Dr. Truffi's clinic and 1 case of precancerous dermatosis in Dr. Piccardi's services. He reports in detail 2 cases of his own. He differentiates coal-tar cancer from that due to paraffine and other coal products. He says coal-tar cancers have a relatively less grave prognosis and less tendency to metastasis. He discusses the development of the precancerous state and its treatment.

Four papers consider mule-spinners' cancer. Wilson, Southam, and Savatard blame the mineral oil, Savatard claiming that ichthyosis simplex is a fertile soil for cancer, keratosis being secondary to ichthyosis.

Robertson claims to show that oil plays little if any part in the etiology of mule-spinners' cancer. He lists the etiologic factors as dirty scrotum, dyes, friction from rough in-seam of overalls worn next to the skin in hot spinning rooms and the use of inelastic braces.

Kingsbury reports scrotal cancer in a man employed in anti-malarial oiling using high boiling fractions of oil. He states that carcinogenic substances have been found by Leitch in the high boiling fractions of coal-tar, Scottish shale oil and oil from Borneo, Assam, Egypt, Burma and Badapur.

No papers dealing only with experimental cancer production have been included in this review.

CONCLUSION

We would emphasize the great importance of industrial dermatitis to the industrial physician, the necessity of detailed study of cases and consideration of all possible irritants to which the worker is exposed; of noting extent and duration of exposures, considering the personal and group factors influencing susceptibility, and not overlooking the importance of the epidermophytons and of pyogenic infections as contributing causes or reasons for slow healing.

Few substances used in industry act as irritants to all skins and few will not irritate especially susceptible skins, whether susceptibility be due to idiosyncrasy, sensitization or constitutional disease.

In general, protection of exposed skin, thorough cleansing after exposures and the use before work of protective substances such as petrolatum, lanolin or vegetable gum pastes and of similar substances after cleaning on skins deprived of natural protecting oils will prevent many cases of skin irritation. While there are few if any specific carcinogenic substances, a variety of organic oily substances will so act on predisposed skins.

HENRY FIELD SMYTH, M.D., *Chairman*

NOTE: The extensive bibliography which accompanied this paper is not printed because of lack of space. Copies of this can be obtained from the Chairman, Henry Field Smyth, M.D., University of Pennsylvania, Philadelphia, Pa., or Carey P. McCord, M.D., Section Secretary, 34 West Seventh Street, Cincinnati, O.

Work of Committee on Administrative Practice*

THE most outstanding concrete result of the seven years' work of the Committee on Administrative Practice has perhaps been the *Appraisal Form for City Health Work,* issued in 1925, and revised after experimental use for one year. The revised form was printed in January, 1926, and at that time it was announced that the form would again be recast after three years. Your committee now presents to you the first triennial revision of this document.

It will be remembered that the *Appraisal Form* was originally prepared with considerable trepidation, and, on the whole, the favor which has attended it, and the stimulation of health practice which has followed on its use, have been exceedingly gratifying to all concerned. The check sheet[1] prepared by H. S. Mustard, M.D., Health Officer, Rutherford County, Tenn., is one of the most recent evidences of its value. However, as we pointed out last year:

> The committee has felt that there were two very real dangers in the practical application of the appraisal principle. It might, on the one hand, invite unjustified and damaging criticism of departments having low scores; and it might, on the other, lead to undue standardization and to stagnation on the part of cities having high scores. The first of these hazards has, so far as we are aware, been completely avoided by the use of the *Appraisal Form* in an individual city only with the approval and on the request of the health officer and by the avoidance of any comparison of total scores obtained by various cities on a comparative basis. The second hazard we have planned to obviate by revision of the *Appraisal Form* at 3-year intervals, and the first revision will be completed during the coming year and presented at the 1928 Annual Meeting. It is planned, not only to alter items in the present form which have been shown to be theoretically and practically unsound, and to increase levels of attainment required for a perfect score to keep pace with current progress; but also, if possible, to include certain new items not now included at all.

The hopes thus expressed a year ago have been fully realized through the devoted labors of a sub-committee headed by George T. Palmer, D.P.H., and the *Appraisal Form* as now revised differs from the old in three general ways:

1. Individual items have at many points been modified, either to eliminate elements of measurement which have proved to be unfair, or to raise or lower quanti-

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* Report of the Committee, presented to the Health Officers Section of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

tative standards in accordance with experience and with the progress of the development of municipal health services. In particular, the sections on school hygiene and on popular health instruction have been radically recast. It is believed that, from this standpoint of adjustment in detail to the accurate evaluation of health practice, the new form is vastly superior to the old one.

2. It has been found possible to include at this time two of the newer lines of health activity which promise to be of predominant importance in the future—the control of cancer and the control of heart disease. We realize that the schedules for these activities are in many respects tentative and have therefore given to them only very small weight in comparison with the more familiar activities. We do feel, however, that it is most important to recognize the real problems of the future, in which the progressive health officer must interest himself in an increasing degree, and at least to direct attention to the need for an accurate knowledge by the health officer of what is being done in his community with respect to these problems.

3. A change of fundamental importance has been made in the general plan of weighting activities. The original form included 8 major types of activity, ranging in value from popular health instruction with 20 points, to communicable disease control with 175, the total of all points scored in the *Appraisal Form* being 1,000. In practice it has been found that comparison of total scores on a basis of 1,000 was of little practical value and often misleading, and that in the actual use of the form it was very common for health officers to re-compute the score for each activity on a basis of 100 per cent, to obtain a more direct measure of the activity in question. We believe that it is more important for the health officer to know how each of his activities compares with other activities in his own city and with similar activities in other cities, than it is to know how his total score compares with the total score of some neighboring community. In the new form, therefore, each activity is scored on a basis of 100, and a total score on the basis of 1,000 can be obtained by applying a series of activity weights. Both activity scores and total score can be obtained in either case, but according to the present plan the activity scores come out directly and the total score if desired must be computed afterward.

We suspect that there may be members of the Association who will find these changes unduly radical, but we have been influenced by the belief that it is first of all essential to keep the *Appraisal Form* a fluent instrument for measuring current progress, and we believe that the changes which have been made will tend toward the objective of the entire work of the committee—the stimulation of sound and progressive improvement in the health service of the country.

In addition to the revised *Appraisal Form,* the committee presents three sub-committee reports which are indicative of the whole-hearted devotion which all the members of the committee have rendered during the year. C. Hampson Jones, M.D., has a progress report on standard health department reports; Henry F. Vaughan, D.P.H., a report on model health department ordinances; and George C. Ruhland, M.D., a series of model record forms[2] dealing with other fields of activity than those covered last year.

The Sub-Committee on Organized Care of the Sick, headed by

Michael M. Davis, Ph.D., has prepared during the year a statement of policy regarding surveys of hospitals, clinics, city physicians and similar facilities. The statement after having had the benefit of the criticism of health officers through distribution via the *Health Officers' News Letter,* was printed in the JOURNAL.[3] This statement was also distributed to some 300 community chests, welfare federations and councils of social agencies in the United States and Canada. Surveys within the proper scope of the committee will be regarded for the present as including such matters as the need for hospital beds, clinics or other organized curative facilities of a community; the social and economic groups for which such facilities are needed; the geographical distribution and the interrelations of these facilities to one another and to other interests and agencies of the locality. Surveys of this type would ordinarily be conducted in connection with a study and appraisal of the official health department, the health work of the board of education and voluntary agencies (Visiting Nurse Association, tuberculosis association, etc.), requested by the health officer.

Hitherto, with the exception of the preparation of a tentative *Appraisal Form for Rural Health Work,*[4] the activities of the committee have been limited to municipal health practice. During the past year, however, thanks to the generosity of the Commonwealth Fund, it has been possible to undertake, at the request of the state health officers concerned, state health department surveys in Massachusetts, Michigan and Ohio. The Commonwealth Fund has also contributed a special fund for the initiation of a study which we have long had in mind. It is planned during the next two years to survey approximately 50 rural counties in different parts of the United States, with the counsel of a committee of the Surgeon General's Conference of State and Territorial Health Officers. This work began most auspiciously last summer, and we are fortunate in being able to carry it out in coöperation with the recently organized Committee on the Cost of Medical Care, whose field agent will obtain in some of the same counties visited by us data as to the facilities for the care of illness which are so closely interrelated with the official and voluntary health agencies of the community. It is believed that this study when completed will give us a sound basis for the working out of model health programs adapted to rural areas of different sorts and for the revision of the *Appraisal Form for Rural Health Work* along sound and constructive lines.

In addition to the general studies of the committee, we have as usual conducted on request a number of local health surveys besides the state studies in Massachusetts, Michigan and Ohio, to which reference has been made. The communities covered since the last An-

nual Meeting include: Cattaraugus County, N. Y., Clarke County, Ga., Fargo, N. D., Monmouth County, N. J., Montreal, Can., Rutherford County, Tenn., St. Louis, Mo., Spartanburg, S. C., Syracuse, N. Y., Warwick, R. I., Tompkins County, N. Y., Marion County, Ore., and Los Angeles County, Calif.

The committee has continued its active coöperation with the General Federation of Women's Clubs which, with our aid and that of the Metropolitan Life Insurance Company and the American Child Health Association, has been conducting with increased success a competition in the filling out of a schedule of local community health activities. The schedule filled out by members of the Federation was returned this year by 100 cities and 45 counties, and the state having the best record for such activities and receiving the prize in the form of survey service offered by your committee and by the American Child Health Association this year was North Carolina.

Coöperation with the Chamber of Commerce of the United States has also been continued and seven special bulletins have been prepared by the committee staff for dissemination by the Chamber. A plan for a life conservation contest under the auspices of the Chamber, to be conducted with the coöperation of the committee, is now under consideration.

The personnel of the committee has remained unchanged with the exception that Francis G. Curtis, M.D., and James Roberts, M.D. (ex officio members from the Health Officers Section), have been replaced by E. L. Bishop, M.D., and A. J. Chesley, M.D. The fact that Dr. Bishop became an ex officio member created a vacancy in the appointive membership and this vacancy was filled through the appointment of Charles V. Chapin, M.D.

The committee has for several years felt very keenly the need of a member from the Public Health Nursing Section to aid it in dealing with the nursing problems which form so important a part of its surveys and appraisals. In order to fill this need for the time being the committee has invited Sophie C. Nelson, R.N., to serve as a special adviser to the committee on such problems, and is deeply appreciative of the service she has agreed to render in this connection.

The activities of the committee have been made possible during the past year by a continuance of support from the Metropolitan Life Insurance Company which has given $7,500 and from the Milbank Memorial Fund which has given $5,000 to the Association for its work. In addition to these old friends, the John Hancock Life Insurance Company has made a grant of $5,000 to aid in the work of revising the *Appraisal Form* and in the work of the Sub-Committee on Model

Health Ordinances and on the Organized Care of the Sick. The Commonwealth Fund has given $5,000 for the state surveys and $12,500 for the rural surveys. In spite of this generous aid the resources of the committee have not been fully adequate to the tasks imposed upon it, and an unreasonable burden has been placed upon the staff. It was recognized of course that special studies like the state survey and the rural health survey must be supported by special grants, but it is also essential to remember that the committee needs between $25,000 and $30,000 for general overhead expenses. Every effort has been made to make the local surveys—conducted for the benefit of the communities concerned rather than for the collection of fundamental data—self-supporting, but this is difficult if not impossible to do in every case. In view, however, of the demand for aid from health workers in all parts of the country and of the use to which they are putting the information obtained by the committee, we feel that resources will be forthcoming for the future.

C.-E. A. WINSLOW, *Chairman*
HAVEN EMERSON, *Vice-Chairman*
LOUIS I. DUBLIN, *Secretary*
E. L. BISHOP
HOMER N. CALVER
CHARLES V. CHAPIN
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W. F. DRAPER
ALLAN W. FREEMAN
C. HAMPSON JONES
GEORGE D. LUMMIS
GEORGE T. PALMER
W. S. RANKIN
GEORGE C. RUHLAND
HENRY F. VAUGHAN

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Maternity Insurance in Italy

IN Italy, the only country in the world where compulsory maternity insurance was made the subject of a special law, the number of insured women increased from 640,000 in 1922 to nearly 900,000 in 1927. These women and their employers pay contributions in equal amount into a fund out of which benefits are paid at the time of confinement or miscarriage. To these benefits certain amounts are added from the national treasury. The number of women who received such benefits rose from nearly 34,000 in 1922 to over 40,000 in 1927 and the amounts paid from over three million lire to over four million.—*Boll. d. Lavoro e d. Previdenza Sociale*, Rome, 50, 3: 404 (Sept. 30), 1928.

How to Use Civic Clubs Effectively in Promoting Health Programs*

E. L. BISHOP, M. D., FELLOW A. P. H. A.

Commissioner of Health, State of Tennessee, Nashville, Tenn.

IN THIS country, private effort is a social force ready to the support of any social movement for legitimate enterprise. Particularly in recent years, this private effort is finding expression in the organization of groups with some common interest or for the purpose of promoting civic progress in one or more of its phases. It is in this broad sense that the term "civic groups" is used for the purposes of the present discussion. Hence it includes such groups as chambers of commerce, luncheon clubs, parent-teacher organizations, and many women's clubs, even though the latter, in many instances, may be organized for cultural study rather than civic enterprise.

There can be no more important civic service, whether for the community, state or nation, than protection and promotion of the public health, since disease and physical deficiency directly influence man's ability to work and create wealth for the promotion of his social welfare. Society has recognized this fundamental fact by the erection of machinery for the promotion of the public health in each element of government of this country with the delegation of appropriate powers and responsibilities in the discharge of health functions. In addition, many private and voluntary organizations have been established through philanthropy or public effort. These organizations act as constant stimuli and supports to the health agencies of government.

If we grant that civic groups are organized for the promotion of civic enterprise and if protection and promotion of the public health be an important and legitimate civic enterprise, the community of interest is obvious and it is possible to use civic groups effectively in the promotion of health programs.

Necessarily, the health agency, whether central or local, must exert the leadership essential to the development of coöperation and support from the civic groups. The question confronting us is: "How

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may this leadership be properly exercised?" Surely the first need is that the executive or health officer shall have subjected his health problems to critical analysis and determined upon the machinery, organization and methods essential to solution. As a part of the analysis, death rates and other indices of the community health problems will have been studied carefully, not only in their local relationships but also in relation to communities having more nearly adequate health organizations. The health executive is then in a position to carry his message and plea for coöperation to the civic clubs.

Since securing the essential machinery for solution of his health problems involves the question of financial support, a sound appeal can be made to business organizations. The economic disadvantages presented by high death rates from communicable infections, the high cost of physical inefficiency of labor, and the bar to industrial expansion offered by excess mortality rates, can be presented as sound arguments to chambers of commerce. Industry today is inquiring into the health conditions of areas in which it seeks expansion. To the luncheon clubs, the health executive may carry essentially the same general message presented to chambers of commerce, for they too consist principally of business executives. To parent-teacher organizations, he may present not only the general health problems, but may emphasize particularly the child health problem and school health conditions. Throughout each presentation, he must make the point that the campaign for good health is not an isolated engagement, but a continuous warfare. This is perhaps the most important essential of all in view of the fact that the health organization must develop the sustained interest and support of civic clubs if such groups are to be effectively utilized as a social force.

Proof of the effectiveness of this method of approach is found in the success attending the efforts of the State Conference of Chambers of Commerce and Civic Clubs in Tennessee relative to securing expansion, not only of the program of the State Health Department, but also of local health departments. This conference meets in annual assembly with delegates from constituent chambers of commerce, luncheon clubs and other civic organizations. In 1924, the health committee of a chamber of commerce became deeply interested in the fact that Tennessee was being inadequately served by its health organization, due to the complete inadequacy of existing facilities and machinery for health protection. An appeal was made to the State Health Department for information, and an entire afternoon of the program of the state conference was devoted to the presentation of very carefully and exactly compiled information relative to the state's health problems and the facilities essential to their solution.

It is important to emphasize that this health committee of a chamber of commerce, composed as it was of both business men and practicing physicians, had complete charge of the program and was served by the State Department of Health rather than itself serving the department.

In the development of the program, the committee called upon leading physicians of the State Medical Association, leading business men of the community and the State Department of Health for the presentation of information essential to consideration of the state's health problems by the conference. The State Health Department was required to present the comparative studies of mortality rates, physical deficiency rates, per capita appropriations for the country as a whole, a specific budget that would provide for such growth in a single biennium as was consistent with good business administration and a comparison of local health organization with similar developments in other states.

Throughout the preparation of these data, the State Department exercised the most scrupulous care as to accuracy and called upon the U. S. Public Health Service for a survey of its facilities and recommendations for expansions in order that it might have the benefit of a broad, detached point of view. From the data so compiled, the committee and its speakers developed their presentations, and so effective were these that during the entire program not one word of objection to substantially increased appropriations and to substantial expansion of activity was voiced by a single delegate or attendant at the conference. Not only was this true, but the conference instructed its Resolution Committee to prepare strong resolutions voicing the approval of the conference and bespeaking the coöperation of all business organizations in the translation of the recommendations into action by appropriating bodies. The resolutions were unanimously adopted, and each delegate was instructed to carry the program to his home organization and thoroughly familiarize the local community with the objectives of the chambers of commerce. Speakers were delegated from local chambers of commerce to appear before local medical societies and present the program for consideration. Thus business was seeking the coöperation of medicine, which was given to the fullest extent.

Practically every medical society in the state passed resolutions petitioning the State Legislature to increase substantially the appropriation for health work in the state. In addition, the local medical societies delegated speakers to attend the community meetings with representatives from the local chambers of commerce in an

effort to carry the message to the general public. This measure was extremely effective and the net result of the activity by the chambers of commerce and the medical societies was the adoption of a 60 per cent increase in the budget for the State Department of Health, with practically no dissenting opinions in the State Legislature.

When it is considered that this entire project was organized and carried out by business executives and busy practitioners of medicine who paid their own travelling expenses in all instances and who received nothing whatever in recompense save the satisfaction of a service performed, the accomplishment must stand forth as a most remarkable achievement by a group of civic organizations.

The state conference has not, however, been content with its primary accomplishment. Throughout the four years since its first activity in behalf of health work, it has sustained its interest, and each year has called upon the State Health Department for a report of progress. Each biennium it has developed plans for further expansion of health work in coöperation with and in support of the State Department of Health. Individual chambers of commerce have supported the expansion of local health work, and throughout the state business is constantly and increasingly expressing its interest in the development of better health organization.

The specific results of this plan of action have been an increase in the per capita appropriation for the State Health Department from 3.3 cents in the biennium 1923–25, to 5.24 cents in the biennium 1925–27, and 10.27 cents in the biennium 1927–29. Thus, the state is now appropriating and spending more than three times the sum for health protection that was being spent when the civic groups first began direct support of the health program. In addition, municipal appropriations for the protection of public health have grown and the percentage of the rural population under the protection of full-time county health work has increased from 13.5 per cent in 1923, to 37.9 per cent in 1928.* Increased appropriations and advances in public health organization are principally attributable to the coöperation of civic groups.

It is easily deduced from the foregoing description of our experience that civic groups may be effectively used in two relationships to health programs. First, in securing essential funds from appropriating bodies for expansion of the health machinery such groups can render a most necessary service. Second, civic groups supply that link in the community organization which will enable the health machinery to decentralize its efforts in such a manner as to serve the community more effectively. There is an additional avenue of serv-

* 1926 population estimate used for 1928 percentage.

ice in the latter relationship for parent-teacher organizations, and local women's clubs are especially helpful in local health work.

An example of most effective use in such relationship recently came under the writer's observation. The County Health Officer of Davidson County wished to secure the administration of diphtheria toxin-antitoxin to a large group of preschool children. It was clearly impossible for his organization to reach each individual family and secure the coöperation of the parents in bringing the younger age groups to a clinic. He, therefore, requested the school teachers to place the matter before the local parent-teacher associations with the request that they assume this responsibility. In turn, the parent-teacher associations organized each community into blocks and visited the individual homes in an effort to secure the necessary attendance of preschool age children on a specific date at the local school. So effective was this organization that, in one small school community, more than 150 children between the ages of 6 months and 5 years were given toxin-antitoxin, and similar results were obtained in other schools.

Often, the complaint is made that there are no existing civic groups through which to work. If this be true, it is usually because effective leadership has not been exerted in the development of civic groups. Such a condition existed in Rutherford County, Tenn., when the Child Health Demonstration was first established in 1924. The director of this demonstration was not discouraged, however, and proceeded with the development of "community health committees," the chairmen of which constituted a part of the membership of a central county health committee. The remaining membership was made up of members at large, including representation from the medical profession, the dental profession and the educational system. In the evolution of this community organization certain of the community health committees are becoming parent-teacher associations, which in turn appoint subcommittees to act as the community health committee. This is an entirely satisfactory and desirable development, since it expands the community organization and promotes the exercise of local initiative.

Experience in Tennessee forces us to the conclusion that civic clubs may be effectively used in promoting the health programs of the state and local health organizations. It further demonstrates that such groups are useful not only in securing increased appropriations for the expansion of health machinery, but also in increasing the efficiency and spread of activity by existing local health departments. There is also evidence that, if existing inadequate civic groups are properly utilized, the health program may supply that community of interest which will make possible the development of more effective community organization.

Registration Affairs*

ONLY 4 states remain outside the U. S. Registration Area—Nevada, New Mexico, South Dakota and Texas.

Now that the goal of completing the registration area before 1930 is in sight, it is high time to consider some of the remedies needed to improve not only the percentage of registration throughout the country but also the quality of that registration.

A better death certificate is needed and the suggested form for the next decade will be discussed by the Committee on Forms and Methods of Statistical Practice.

To improve attempts to analyze mortality and birth data by occupations, more careful statements of occupations are needed upon birth and death certificates. The new birth and death blanks have been so drawn up that better statements of occupations should be forthcoming.

To permit greater refinement of the crude birth and death rates, more attention should be given to correct these rates for the births and deaths of non-residents.

These annual meetings of the Vital Statistics Section should from now on serve more than ever before as the clearing house for state and city registrars to exchange ideas so that every registrar will learn about every successful registration method and device employed elsewhere.

In some states, the situation can doubtless be improved by slight amendments to the present laws. In other states, greater publicity regarding the benefits of good registration might lead to bigger state appropriations for the work and so to marked improvement in registration itself.

The following are a few of the registration matters which need further careful consideration:

1. Should $.25 for each certificate be held as the reasonable remuneration for a local registrar, or should it be increased to $.50, or should this be done in some other manner?

Mr. Fales has suggested as a possible method that the increase be made by paying each registrar a base rate of $2.00 each month providing that the report is mailed to the state registrar promptly, in addition to the present fee of $.25 for each certificate filed. Mr. Fales continues:

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* Report of the Committee, presented to the Vital Statistics Section of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

This is the basis of pay in New York State, which I believe largely contributes to their practically 100 per cent reporting of registrars each month.

The advantage of this method of increase is that the registrar in a sparsely populated district who now may receive only $5 or $10 for his year's service would receive a relatively much greater increase than a registrar in a town now receiving $100 or more for his services. I think you can readily see the advantage of such a method of increase in helping us secure better pay for registrars in strictly rural districts where the amount of work necessary to secure a certificate for an unreported birth or death is considerably more than it is for a registrar of a city or town, and it is in our sparsely populated districts that we must make it worth while for registrars to go out and get up certificates.

2. Should physicians and undertakers be tabooed as local registrars?

3. Where there is a full-time county health officer, should he upon his request be appointed an agent of the state registrar so that the certificates of births and deaths could be routed through this health officer on condition that they be passed on promptly to the state registrar?

We cannot emphasize too many times or too strongly our sincere conviction of the great benefit which results from the frank exchange of ideas at these meetings of the American Public Health Association, not only in the general and section meetings but in the frank discussions which almost inevitably follow the meeting of any two registrars in the lobbies, in the dining halls, and on the sight-seeing tours. Frank discussion of all registration problems is in order at all times at these annual meetings.

WILLIAM H. DAVIS, M.D.,* *Chairman*
A. A. WHITTEMORE, M.D.
W. THURBER FALES, Sc.D.
STEWART G. THOMPSON, D.P.H.
CARL F. RAVER, M.D.

* Deceased.

Mexican National Committee on Infant Welfare

A NATIONAL committee on infant welfare (Comite Nacional de Proteccion a la Infancia) has been established in Mexico City for the purpose of combating infant mortality. It is a private organization, but it has announced its intention to coöperate with the Government.

A few days after its organization the committee started a campaign for raising 1,000,000 pesos, to which the Federal Department of Public Health responded with a contribution of 256,000 pesos.—*El Universal,* Mexico City, Jan. 25, Feb. 3 & 5, 1929.

When Are Meats or Fish Spoiled?*

IT is extremely difficult to tell with accuracy when food is spoiled or decomposed. There are all degrees of spoilage ranging from practically normal to a condition of putrescence. Aside from the ordinary organoleptic tests such as appearance, odor and taste, few really satisfactory criteria or tests for spoilage are known. We are not concerned primarily with the far advanced cases of decomposition, which are readily perceptible to the senses, but with those incipient, doubtful, border-line cases which we encounter every day not only in food inspection work but in our own homes as well. A decision must be made. Is the meat fit to eat? Are the oysters sound? Is this fresh fish?

Meats, fish and shellfish possess a very important place in the diet of man. In 1927 the consumption of meat per capita in the United States was 140 pounds; of fish and shellfish about 18 pounds. The high quality and wholesomeness of these foods should be guaranteed to the consuming public. Meats and fish are particularly favorable pabula for the rapid growth of bacteria and the production of toxins. Certain decomposition products such as ammonia, hydrogen sulfide, indol, amino acids, trimethylamine, free fatty acids, etc., are known to be formed in certain types of meat and fish spoilage. Are there not perhaps simple tests by which the laboratory worker or even the inspector may verify his organoleptic observations? Likewise is it not possible that simple direct microscopic or bacteriological technics may be perfected which will aid greatly in detecting with speed and precision incipient spoilage in these foods?

Your committee, sensing the attitude of the public, considers that this question of the detection of incipient decomposition in meats, fish and shellfish should be brought to the attention of our Section. In order to bring the subject up to date, a survey of some of the more important contributions to the literature of meat and fish spoilage with particular reference to methods of detection has been made.

Weinzirl[1] has given an excellent description of the spoilage process in biological terms:

But spoilage is a complex process. In the first place it is a souring of the meat, due to fermentation of the carbohydrates present, by aerobic, facultative and an-

* Report of the Committee on Meat, Fish and Shellfish, presented to the Food, Drugs and Nutrition Section of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

aerobic bacteria; secondly, it is a digestion of the proteins by aerobes and facultative anaerobes without abundant evolution of sulfides; thirdly, it is the production of indol, skatol and other vile smelling compounds by aerobic, facultative and anaerobic bacteria; and fourthly, it is putrefaction with the production of sulfides by anaerobes.

It is well known that spoilage may be due to the cell enzymes alone—such as autolysis. Fellers and Parks,[2] Hunter[3] and Almy[4] have reported independently on certain types of spoilage in crabs, salmon and sardines which are autolytic rather than bacterial in nature. On the other hand, where microörganisms are present, the spoilage process is still due to extracellular enzymes elaborated by them. As stated by Effront:[5]

> It is impossible to give a simple and unchangeable scheme for decomposition, since the quality and the quantity of the products formed are dependent upon the nature of the acting enzymes, which, themselves, are functions of the species of bacteria present, of the albuminoid substance to be transformed and also of the physical and chemical conditions of the medium.

During progressive decomposition of meats and fish, the bacterial flora undergoes at times a profound change; some species forming acid, others breaking down proteins into peptones and amino acids, and others to still simpler nitrogenous compounds. It is well known that certain bacteria are able to produce ammonia and hydrogen sulfide; others, indol; still others, trimethylamine. Some species may form all of these compounds, yet others are incapable of producing any deep-seated changes in foods. Unfortunately, it is to the latter group that so many of the food poisoning organisms belong. It is well known that putrefaction is due to anaerobic bacteria alone. While it may be found that a certain sample or kind of meat or fish, while undergoing spoilage, usually gives a test for hydrogen sulfide, this is not invariable. The researches of Hoffstadt,[7] Weinzirl and Newton,[8] Cary,[9] LeFevre,[10] and Brewer[11] show that meat is often grossly contaminated with bacteria, but that there appears to be no clear-cut correlation between the quality of the meat and the bacterial count. The Weinzirl[12] anaerobic spore test is useful, and Hoffstadt states that the presence of proteolytic anaerobes is a definite way by which the keeping qualities of meat can be predicted. Aside from the anaerobic spore test and total counts of bacteria, little of value has been obtained by bacteriological means.

Biochemical tests for the detection of decomposition in meats, fish and shellfish have been investigated to some extent. Arbenz,[13] working with the degree of oxygen consumption and the methylene blue reduction test, has found these determinations of value particularly when the meat is in the later stages of spoilage. The various methods

of determining the amino acid nitrogen to indicate the stage of decomposition in meats and fish were investigated by Luttge and von Mertz,[14] Ottolenghi,[15] Waksman and Lomanitz,[16] and Hoagland.[17] The pH value of the serum using the quinhydrone electrode has been used by Herzner and Mann.[18] Eber,[19] Richardson,[20] Sears,[21] and Falk, Baumann and McGuire[22] made ammonia, purine nitrogen determinations and studied other nitrogenous fractions in fresh and spoiled meats. Falk and McGuire[22a] concluded that it was necessary to know the history of the sample in order to interpret correctly the chemical data. They discovered that the amount of ammonia present in a given sample of meat was much greater at the time of spoilage if the meat had been kept at a low temperature than if it had been stored at a higher temperature. This difference they attributed to autolysis. Clough,[23] working with salmon, concluded that although the determination of indol could not supplant odor and physical appearance in the examination of canned salmon, indol afforded a valuable check on the organoleptic test. Hunter and Harrison[24] have demonstrated that the pH is a valuable clew in detecting spoilage in oysters, but Hunter and Linden[25] found no correlation between quality and bacterial count.

Weaver's work,[26] using the production of hydrogen sulfide after the incubation of the meat in nutrient broth as an indication of incipient spoilage, is the most outstanding of the past 2 years. Weaver used meats spoiled under controlled conditions, and there is a possibility that meat spoiled in commercial refrigerators or display cases may not always be polluted with hydrogen sulfide producing bacteria. Korff[27] has found that although the hydrogen sulfide test is a valuable aid, some samples of meat do not produce hydrogen sulfide even when undoubtedly decomposed. These data check Almy's results[28] on canned fish. Weaver found that more of the organisms in fresh meat reduced methylene blue than of those in putrefying meat, but concluded the hydrogen sulfide test to be of more value than the methylene blue reduction. Kerr[29] has found that the normal ratio of water to protein in meats is 1:4. Variations from this ratio may indicate either loss of nitrogen or the addition of water.

Tillmans, Hirsch and Kuhn[30] recently reported careful studies on spoiled meat products, using the meat serum for their tests. They found an increase in volatile acids in the distillate from the dilute acidified serum. They likewise state that a positive isonitrile reaction furnishes an indication of incipient decomposition. Horowitz-Wlassowa[31] has just reported that pH, acidity of the meat extract, refractive index, biuret reaction, total nitrogen or iodine absorption value, give no indication as to freshness of meat. However, the heating of

aqueous meat extract with magnesium oxide for 5 minutes at 50° C. liberates ammonia from ammonium salts, but not from proteins. Litmus paper will detect as little as 0.02 per cent of ammonia. Fresh meat does not give a positive test. Katrandjieff[32] made a very thorough study of the use of the iodine absorption test. He found it of value in detecting spoiled meats.

References could be multiplied, but sufficient evidence has been adduced to show that progress is being made. It is to be hoped that further researches along these lines will be carried out. If simple, rapid, laboratory or field tests for the detection of incipient decomposition in meats, fish and shellfish can be devised, they will be of untold value not only to the public health laboratory worker or field inspector but to the handlers of these products and the general public as well.

CARL R. FELLERS, *Chairman*
ALBERT C. HUNTER
F. A. KORFF

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Fruits, Vegetables and Their Products*

IN the last report of your Committee on Nutritional Problems,[1] emphasis was laid on the importance of conserving, as far as possible, the vitamin content of foods, and it was stated that the optimum amount of vitamins for health is probably far greater than the minimum amount necessary to afford protection from deficiency diseases. Recognizing the correctness of that committee's views, we would suggest the need of a thorough study of the comparative nutritive value and vitamin content of tree or vine-ripened fruits and vegetables and those gathered while still under-ripe, as an increasing proportion of raw fruits and vegetables are now harvested and ripened under artificial conditions. We understand that the Bureau of Chemistry and Soils, U. S. Department of Agriculture, is now undertaking such a study.

The artificial ripening and coloration of fruits and vegetables is a subject that is being given much attention by growers' organizations and by federal and state agricultural experts. It appears to be impossible to supply some vine or tree-ripened fruits and vegetables to the larger centers of population without such great losses or expense as to make their use almost prohibitive. Recently the use of ethylene gas, and other unsaturated hydrocarbons, has been found to be more effective for the purpose of ripening than the heat treatment previously used, particularly for citrus fruits and tomatoes. Work done on this subject by Rosa[2] at the University of California on three varieties of tomatoes, using low concentrations of gas, indicates the following:

1. Development of red color takes place in about half the time required when ripened in air in the usual way.

2. In comparing vine-ripened, air-ripened and ethylene-ripened tomatoes, vine-ripened fruits were highest in sugar and low in acids; air-ripened fruits had no more sugar than green tomatoes and were high in acid, and while ethylene-ripened fruits were low in sugar, their acid content was about the same as that of the vine-ripened fruit.

3. Although tomatoes artificially ripened, either in air or ethylene, remain firm much longer, they contain less soluble solids than in vine-ripened tomatoes, but much more than the green fruit when picked.

A study of ripening of cranberries made recently at the Massachusetts Agricultural College showed that vine-ripened cranberries con-

* Report of the Committee, presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

tained more sugar and slightly less acid and pectin than those picked when 25 per cent to 50 per cent colored, as is usually done. Vine-ripened cranberries are likewise better colored and flavored.

In commenting on this new process for artificial coloration, the editor of the *Journal of the American Medical Association*[3] calls attention to the fact that while artificial coloring of immature fruit is prohibited under the Food and Drugs Act, some citrus fruits still appear green after they are fairly mature, judged by certain chemical standards of sugar and acid content, and work on coloring such fruit has been undertaken with official state and federal coöperation. The work of Chace and Church[4] indicates that the ethylene treatment produces no change in chemical composition, even though the respiratory rate of the fruit is increased by such treatment. Since citrus fruits are now widely recommended and prescribed for infants and invalids, as the editorial states, and ethylene-treated fruit may be entirely wholesome, work on the comparative vitamin content of artificially ripened fruits and vegetables and further information on the action of ethylene on their chemical composition and nutritive value seem desirable.

In Mexico, Cuba and the British West Indies the growing of raw fruits and vegetables for United States markets has developed very rapidly, so that some of them are now available practically the year around. For instance, the imports for consumption of raw tomatoes from those countries increased from about 52,000,000 pounds in 1922–23 to about 125,000,000 pounds in 1926–27. This year-round availability of raw fruits and vegetables has been largely a development of the past seven or eight years.

Considerable attention is being given to the preparation and preservation of fruit and vegetable juices. A new process for sterilizing fruit and vegetable juices has recently been patented, which depends on the destruction of bacteria, yeasts and molds, which may be present in the juice, by passing the warmed juice between electrodes. By subjecting it to a mild electric current, it is claimed that complete sterilization is effected. The preservation of citrus fruit juices by freezing is being tried out in a small way, with considerable prospect of commercial success.

The committee report last year was entitled "Canned Foods and the Public Health." Since that report was presented, further steps have been taken by the canning industry to insure the wholesomeness of canned foods. For fifteen years, the Research Laboratories of the National Canners Association have been giving a great deal of study to the problem of determining the nature and heat resistance of organ-

isms that may cause spoilage of canned vegetables and other canned foods, and the working out of adequate sterilizing processes for such foods. As a logical sequence to those studies, the laboratories are extending their study to investigating the sources from which such organisms get into canning plants and points in the machinery and equipment which may be favorable to their growth and multiplication. Having secured this information, it is a comparatively simple matter to change the equipment or otherwise alter conditions that tend to introduce spoilage organisms into canned products.

To facilitate this work and to enable the laboratory to cover as much ground as possible during the short canning season, a complete field laboratory for the bacteriological, chemical and technological work necessary has been installed in an autotruck, in which the corn and pea canneries of the east and middle west were visited last summer. It is expected that danger of excessive bacterial contamination of canned foods at some step of the canning process will be detected, and the trouble removed before spoilage occurs. The work has already thrown light on sources of bacterial contamination in canning plants and has made it possible to eliminate them.

Considerable alarm has recently been felt, by food and health officials, both in this country and abroad, over the shipment from the United States and Canada of fruits which have been sprayed with arsenical sprays. Satisfactory methods for the removal of the residues from such spray have now been worked out by the fruit growers in cooperation with the federal and state agricultural departments.

Quite recently the development of a new method of packing canned vegetables in tin or glass, the so-called waterless pack, has been undertaken. In this method the addition of water in the form of weak brine is omitted, the natural juices and the small amount of water retained on the washed and blanched vegetables being all that is required for the sterilizing process. Most of the air is removed from the can mechanically before sealing, to insure a high vacuum and provide the necessary atmosphere of steam in the can for proper sterilization.

It is claimed that this method of packing vegetables improves the flavor and appearance of the product and prevents the waste of valuable nutrients, which occurs when the liquid in which canned vegetables are ordinarily packed is discarded, as is the practice of some consumers. This method is still in the experimental stage, but the prospects are, at least, encouraging.

Certain canned products, particularly corn, after a period of storage sometimes develop discoloration varying in color from brown to

black. The discoloration may occur over any part of the surface of the container in the form of dark patches or in the contents. This defect is not confined to corn, but probably has caused more trouble in this product than in any other canned food. It also occurs with such products as shrimp, lobster, flaked fish, okra, onions and hominy. When certain canned foods are subjected to the high temperature necessary for sterilization, sulphur compounds are set free from the protein in the food, and these compounds may combine with the metal of the can to form black iron sulphide mixed with some brown tin sulphide. In the case of onions the source of sulphur is largely the volatile oils which give the onion its distinctive flavor. These dark substances are not injurious to health and no objection can be made to them except from the standpoint of the unsightly appearance which they give the container and product. The problem of such discoloration in vegetables has recently been solved by the development of a lacquer lining for cans, which overcomes this trouble. A small amount of zinc oxide is suspended in the lacquer, and the sulphur combines with the zinc, forming insoluble white zinc sulphide, instead of black iron sulphide. In the case of sea foods, the discoloration of the food is avoided by a paper or parchment lining inside the can.

Your committee has endeavored in this report to point out briefly some of the recent progress made in the manufacture and preservation of fruits and vegetables and their products. The subjects covered, we believe, are of particular interest to those concerned with the public health.

H. M. LOOMIS, *Chairman*
C. R. FELLERS, PH.D.
C. A. DARLING, PH.D.

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Maternity Premiums in France

IN 1928 arrangements for paying maternity premiums were in force in 30,353 communes in 82 out of the 90 Departments of France. The average amount of these premiums, paid by the department to poor women at the birth of a child, was 300 francs, to which varying amounts, from 50 francs up, were added by the communes. These premiums are not provided by a National law, but by departmental or municipal regulations.—*Le Nourrisson*, Paris, Jan., 1929, p. xiii.

Hospital and Clinic Services

THE policy of the Committee on Administrative Practice of the American Public Health Association as defined by its Sub-Committee on the Organized Care of the Sick, and approved by the general committee last year, includes in the field service of the committee, the study of the community relationships of hospitals, clinics, and other facilities for the organized care of the sick, making clear that the administrative affairs of the institutions and their professional standards are regarded as properly belonging to other organizations in this field, and not to the American Public Health Association.

This policy has been recently carried out in surveys, under the committee's auspices, in St. Louis, Mo., Cincinnati, O., and Monmouth County, N. J., and it is anticipated will lead to the definition of schedules and forms of information concerning the services for the organized care of the sick, and possibly at a later date to criteria for their appraisal from the community and public health standpoint.

Reports presented at the Cincinnati meeting of the American Public Health Association, and other material, have shown the increasingly close relations existing between hospitals, clinics and health departments and voluntary health agencies in many communities.

Questions frequently arising are: How shall the sufficiency of service for the organized care of the sick—from the standpoint of community and public health interests—be judged? What facts need to be known for intelligent consideration of this matter?

The Sub-Committee on Organized Care of the Sick has thought it would be helpful to the public health field generally, to suggest and outline tentatively a few specific questions which those connected with official and voluntary health work should have in mind in considering these organized curative facilities.

The field service of the committee is frequently asked to advise or give information concerning new facilities which are contemplated in communities of various sizes and with different problems. Obviously, such advice can be little more than a guess unrelated to local needs unless a comprehensive statement of existing conditions is available. It is to help public health workers and others to visualize the essential facts necessary to reach decisions of adequacy both in quantity and type that these questions have been prepared. Though numerous questions more or less interesting will suggest themselves to the reader

as desirable additions to the list, the committee has rigorously kept to those items dealing with the subject in a broad way in order that this list would not be too long for helpful and effective use by a large number of health administrators.

COMMITTEE ON ORGANIZED CARE OF THE SICK

MICHAEL M. DAVIS, PH.D., *Chairman*

GEORGE C. RUHLAND, M.D.
HAVEN EMERSON, M.D.
D. L. RICHARDSON, M.D.
W. S. RANKIN, M.D.
WILLIAM J. NORTON
W. C. RUCKER, M.D.

TWENTY-FIVE QUESTIONS WHICH PUBLIC HEALTH PEOPLE SHOULD ASK ABOUT HOSPITALS AND CLINICS IN THEIR COMMUNITY

1. What hospitals are there in your community for the care of the sick (medical, surgical, obstetrical, children's diseases, etc.)?
   a. Total number of hospitals
   b. Hospitals supported primarily by taxes (city, county, state, federal)
   c. Privately supported hospitals not managed for profit *
   d. Proprietary hospitals (run for profit)*
2. How many beds † in these institutions?
   a. Total number
   b. Tax supported
   c. Privately supported
   d. Proprietary
3. What is the number of hospital beds per 1,000 population (all hospitals)?
4. What was the total number of days' care furnished by the hospitals last year? What percentage was this of the total possible hospital bed days?
   a. Number in all hospitals together
      Percentage of maximum possible
   b. Each hospital separately
5. What number of bed days' care was furnished last year to patients living outside the community? What percentage was this of the total bed days' care furnished?
   a. In all hospitals together
      Percentage of total days
   b. Each hospital separately
6. What was the number of free hospital days' care given? What percentage was this of the total days' care?
   a. All hospitals
   b. Hospitals individually

* Privately supported hospitals not managed for profit include hospitals maintained by charitable or religious corporations or by industry; in general, all hospitals which are managed for the service of the public or for some section of the community and from whose operation no individual derives financial support. Proprietary hospitals are institutions incorporated as business enterprises and run for profit, or unincorporated hospitals run by individuals for profit.

† Beds should be taken to include bassinets for babies. It is desirable to state the number of bassinets separately, in addition to giving the total beds including bassinets.

7. How are hospitals in your community rated by the American College of Surgeons and the American Medical Association (specify for each hospital)?

8. Which of the hospitals maintain out-patient departments (dispensaries)?

9. What other clinics which treat ambulatory cases of disease but which are not connected with hospitals exist in your community?

10. What was the number of visits to clinics last year?

a. To the out-patient departments of hospitals
b. To all other clinics
c. Total visits

11. How many clinics, conferences and classes of public health interest are maintained (tuberculosis, venereal disease, prenatal, infant, preschool, mental hygiene, child guidance, heart, cancer, health examination)?

a. In out-patient departments of hospitals
b. By the health department
c. By other agencies outside the hospitals or health department
d. Number of visits to all these clinics last year

12. What were the total current expenses of the hospitals in the community last year?

a. For tax supported hospitals
b. For other hospitals
c. Total

13. What was the total income to the hospitals from patients? What proportion did this bear to the total current income of the hospitals from all sources?

a. Tax supported hospitals:
   Income from patients
   Percentage of total current income
b. Other hospitals:
   Income from patients
   Percentage of total current income

14. What was the investment by the community during the last 5 years in new hospital buildings or permanent improvements in existing buildings?

a. From tax funds
b. From private funds

15. What was the per capita cost per day's care last year for the hospitals of the community (include out of town patients in considering per capita cost)?

a. All hospitals
b. Hospitals individually

16. Which hospitals and clinics have organized social service departments?

17. How many beds are available for the isolation and care of acute communicable diseases (diphtheria, scarlet fever, smallpox, measles)?

a. In general hospitals
b. In special hospitals
c. Total beds

18. How many beds for the care of tuberculosis exist in your community, or are accessible?

a. General hospitals

b. Special hospitals or sanatoriums
c. Total beds
d. Number of beds per 100 deaths from tuberculosis (3-year average)

19. How many beds for the care of mental disease cases exist in your community, or are accessible?

a. In tax supported hospitals
b. In privately supported hospitals
c. In proprietary hospitals
d. Total beds

20. How many institutions furnishing convalescent care (including medical service) exist in your community? How many beds are thus provided?

a. Tax supported institutions
Number of beds
b. Privately supported institutions
Number of beds
c. Proprietary institutions
Number of beds
d. Total

21. How many institutions are provided for chronic * illness (including medical service)?

a. Tax supported institutions
Number of beds
b. Privately supported institutions
Number of beds
c. Proprietary institutions
Number of beds
d. Total

22. How many of the physicians in your community have the privilege of hospitalizing and treating cases in local hospitals? What percentage is this of all the physicians in your community?

23. How many diagnostic and pathological laboratories are generally available to the medical profession in the community? Which laboratories include X-ray service?

a. In hospitals
b. By the health department
c. By other agencies

24. In what per cent of all deaths occurring in local hospitals last year was post-mortem examination made?

25. What organizations in your community furnish bedside nursing care?

a. All organizations
Budget
Patients cared for
Number of visits
b. Each organization separately

* A chronic patient is defined as a person who has been or is likely to be incapacitated by disease for a period of 3 months, who needs medical or nursing care, and in whom incapacity will probably continue for an uncertain period.

Care of Communicable Diseases in General Hospitals*

DENNETT L. RICHARDSON, M. D.

City Hospital, Providence, R. I.

NO LONGER ago than 1860 it was learned through a questionnaire from the London Fever Hospital that 11 general hospitals in London admitted a limited number of patients sick with contagious diseases, in 5 of which they were admitted to the general wards, and in 6 of which separate wards were set aside for their care. It was also learned that of 20 general hospitals throughout England 9 refused fever cases, 5 distributed them in the general wards and 6 maintained separate wards for them. At that time a spirited discussion was going on in London as to whether it was safer for patients and hospital personnel to treat contagious diseases in general hospitals or in special hospitals set aside for their care.

Those who claimed that it was safer to care for contagious diseases in general hospitals than in isolation hospitals reasoned that if not too many contagious patients were admitted the infection would be diluted, whereas in hospitals devoted to contagious diseases alone it would be more concentrated, and therefore more danger would exist for patients and hospital personnel. However, further investigation of the number of cross infections and the amount of illness among members of hospital staffs revealed that both were actually less in the London Fever Hospital than in general hospitals in which contagious patients were cared for. It should be remembered, however, that it was not until some fifteen or twenty years later that Pasteur, Koch and other investigators discovered disease producing germs, and in the light of our present knowledge the conclusions arrived at in the London investigations were well founded as conditions existed in 1860.

These studies led to the construction of isolation hospitals on a rather widespread scale and of a permanent character. The London Smallpox Hospital had been established in 1745, the Lock Hospital for Venereal Diseases in 1746 and the London Fever Hospital in 1802. With these and a few other exceptions, previous isolation buildings

* Read before the Health Officers Section of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

had been built for leprosy, which was very prevalent in Europe about the 15th century, epidemics of smallpox, cholera, plague and typhus fever. For the most part they were of temporary construction and were buildings for the segregation of these patients rather than hospitals in the modern sense.

We have seen even up to the present time a survival of this idea of segregation and crowding in hospitals for contagious patients, and the lack of clinical laboratories, X-ray and other diagnostic and treatment facilities with which every general hospital is provided. There has been no better example of this attitude in the United States than the proverbial pest house. It is only recently that a real interest in the treatment of contagious diseases has been shown.

Up to 1860 hospitalization of such diseases as scarlet fever, diphtheria, measles, whooping cough, etc., had been carried on to a limited extent. About this time England was suffering from a very severe outbreak of scarlet fever attended by a high fatality rate and, in fact, it was this epidemic that was largely responsible for the 1860 investigations. There followed in the British Isles an intensive building program of isolation hospitals, and by 1890, in a considerable number of English and Scottish cities, as many as 90 per cent of patients sick with diphtheria and scarlet fever were cared for in special hospitals. In this country among the earliest isolation hospitals to be established were the Philadelphia Hospital for Contagious Diseases built in 1865, the Willard Parker Hospital in 1884 and the Boston City Hospital wards in 1895.

The facts concerning the modes of transmission of infectious diseases learned during the last thirty years have led to revolutionary changes in methods to control them both in the community and in the hospital. Previous to the discovery of disease producing germs, ideas about the modes of transmission were vague, and efforts to control them either were nonexistent or were very crude. The discovery of disease producing germs ushered in a new period during which atmospheric transmission was looked upon as a great factor in their dissemination because these germs could sometimes be recovered from the air in contagious disease hospitals and elsewhere.

The first investigations which led to the correction of the idea of the importance of atmospheric transmission were carried on in the Hospital for Sick Children, in Paris, by Grancher. During a 10-year period, beginning in 1890, he admitted in the general wards of this hospital a limited number of contagious disease patients. Each bed was surrounded by a wire screen to keep the patient from contact with those suffering from other diseases. Within this enclosure were kept

the nursing utensils, which were sterilized on removal, and also gowns and washbasins in which doctors and nurses washed their hands after caring for the patient. Grancher conclusively demonstrated that scarlet fever, diphtheria and measles were rarely carried through the air.

From this study resulted the construction of the Pasteur Hospital in Paris, which was the first to isolate in different rooms on the same ward floor different kinds of infectious diseases. Atmospheric transmission was disregarded. In this hospital painstaking care was exercised to prevent both direct and indirect contact. The cross-infection rate since it was established in 1900 has been about 1 per cent. Very soon the introduction of this method into England followed and a little later it was introduced into this country.

It has been found that, of the infectious diseases, cross-infections of measles and chicken pox are more numerous than with others, and yet low enough to make the method practicable if the technic is rigidly enforced.

Our experience with this method at the Providence City Hospital over a period of 18 years is presented here in tables. The total number of various diseases cared for during this period will be found in Table I.

TABLE I

PROVIDENCE CITY HOSPITAL
CONTAGIOUS DISEASES

1910–1927

Disease	Cases	Disease	Cases
Anthrax	3	Pneumonia	276
Chancroid	37	Poliomyelitis	134
Chicken pox	297	Rubella	330
Diphtheria	4,708	Scarlet fever	4,332
Diphtheria carrier	466	Syphilis	2,737
Encephalitis	29	Tonsillitis	1,021
Erysipelas	286	Tuberculosis (pul.)	2,489
Enteritis	48	Tuberculosis (other)	167
Gonorrhea	978	Typhoid fever	34
Influenza	719	Variola	46
Laryngitis	142	Whooping cough	800
Measles	1,865	All other diseases	2,948
Meningitis	96	Total	25,150
Mumps	162		

In Table II will be found the record of all cross-infections during the same period and the number for each of the more common diseases.

In Table III will be shown statistics of the frequency of infection among hospital officers and employes during a period of 15 years.

The establishment of new scientific facts concerning the modes of

TABLE II

DISEASES CONTRACTED IN THE HOSPITAL
CROSS-INFECTIONS
1910–1927

Year	Chicken Pox	Diphtheria	Measles	Scarlet Fever	Whooping Cough	Other Diseases	Total	Per Cent
1910	3	3	5	4	..	1	16	2.0
1911	..	1	13	5	..	..	19	2.0
1912	38	2	12	7	3	3	65	6.3
1913	5	..	4	3	1	3	16	1.7
1914	4	1	2	1	..	1	9	1.0
1915	25	6	13	2	..	..	46	4.6
1916	16	1	5	8	..	..	30	1.8
1917	3	3	..	1	1	2	10	0.8
1918	..	1	18	..	3	10	32	1.9
1919	1	2	..	2	..	2	7	0.5
1920	..	1	15	5	..	..	21	1.4
1921	14	..	5	3	..	1	23	1.9
1922	5	..	..	1	5	..	11	0.8
1923	..	..	9	1	5	4	19	1.3
1924	27	..	..	..	2	..	29	1.8
1925	..	..	4	4	1	3	12	0.8
1926	26	1	5	1	..	10	43	2.6
1927	23	1	5	5	3	5	42	2.6
Total	190	23	115	53	24	45	450	

NOTE: While general hospitals do not publish or rarely keep track of the number of contagious diseases occurring in their wards, I believe that the rates just presented compare favorably for general hospitals in which children are cared for.

transmission of infectious diseases is having a very great effect on the methods employed in the further control in the community. Fumigation, which only a few years ago was practiced everywhere, has been almost entirely given up because Dr. Chapin found that it was unnecessary. Likewise, the knowledge that the common infectious diseases found in this country are communicated through contact and not through the atmosphere, is bringing about revolutionary changes in isolation hospital administration.

Since it is evident that several different infectious diseases can, with reasonable safety, be cared for on a single ward floor, it makes it feasible for the smaller cities and even the larger towns to provide hospital accommodation for them. Formerly it would have been impossible because of expense, since a separate ward at least would have had to be provided for each disease. The whole country will be benefitted by a more widespread availability of accommodation for infectious diseases, both from the standpoint of preventing their dissemination and, equally important, of the better care which the patients will receive.

Satisfactory hospitalization of infectious diseases should include

the very best medical and nursing care at the least possible expense. It is well recognized by hospital administrators that the most efficient hospitals are neither too large nor too small. It is quite possible for cities like New York, Boston, Philadelphia, Chicago and other large cities to build and maintain special isolation hospitals, modernly equipped and adequately staffed at reasonable cost. But in cities, counties and towns of less than 100,000 population it is advisable, wherever possible, to locate wards for infectious diseases on the grounds of some well equipped and well staffed general hospital.

There are several reasons which justify this recommendation. In a general hospital, to have close at hand wards for the care of infectious diseases in which can be isolated cases which develop among patients, nurses and other hospital personnel, is a great help and comfort. Very often patients sent to general hospitals are found to be suffering from some infectious disease or at least are very suspicious cases. Not infrequently operative conditions occur in patients who are ill with or convalescent from some infectious disease. It is much

TABLE III

PROVIDENCE CITY HOSPITAL

CONTAGIOUS DISEASE AMONG EMPLOYES
1910–1925

Employes	Number	Scarlet Fever	Diphtheria	Rubella	Measles	Mumps	Chicken Pox	Smallpox	Total	Per Cent
Pupil Nurses	1,777*	91	73	16	11	7	4	1	203	11.4
Graduate Staff	70	2	4	2	..	1	..	..	9	12.9
Temporary Graduates	155	..	..	..	..	..	..	..	..	..
Nurse Helpers	28	2	2	..	..	..	..	..	4	14.3
Physicians	122	2	5	..	..	1	..	..	8	6.6
Ward Maids	58	3	2	..	..	..	..	..	5	8.6
Office Employes	64	2	1	..	..	..	..	..	3	4.8
Laundry Employes	131	2	1	..	..	..	..	..	3	2.3
Housekeeping Staff	331	..	3	..	..	..	..	..	3	0.9
Porters	79	..	..	..	..	1	..	..	1	1.3
Ambulance Staff	17	..	..	..	..	..	..	..	..	..
Laboratory Staff	34	..	..	..	..	..	..	..	..	..
Engineer's Staff	68	..	..	..	..	..	..	..	..	..
Orderlies	18	..	..	..	..	..	..	..	..	..
Total	2,952	104	91	18	11	10	4	1	239	8.1

* Average period of training of pupil nurses, 3 months
Of 1,777 pupil nurses:
344 previously had scarlet fever
276 previously had diphtheria
1,499 previously had measles

less embarrassing to transfer them to isolation wards in the same hospital than to be obliged to send them home or to some isolation hospital. Moreover, there are several acute diseases such as typhoid fever, pneumonia, meningitis, acute throat conditions, transmissible skin diseases, etc., commonly admitted to general hospitals, which can be cared for with better success and safety in wards set apart for infectious diseases, than by distributing them in wards in which non-infectious diseases are cared for. By utilizing some of the isolation wards for acute infections with a low degree of transmissibility, and other wards for the more highly transmissible diseases, a hospital will be prepared to furnish better medical and nursing care, and both patients and hospital employes will be much better protected.

During the World War the army medical and nursing services found it impossible to locate a sufficient number of doctors and nurses who had had any training in infectious diseases and in isolation hospital administration. It is a training which is extremely important to every physician and nurse. Much interest is now being shown in this training and more and more hospital training schools are acquiring affiliations with isolation hospitals. But these hospitals are too few in number to provide such teaching to all physicians and nurses; but should general hospitals throughout the country, so far as community needs require, build and maintain isolation wards, this type of training would become available to a greatly increased number of internes and nurses.

From the standpoint of service, patients ill with infectious diseases are much better off than in small isolation hospitals. General hospitals are usually staffed by the best specialists in the community and their services would be more promptly and regularly available. Likewise, general hospitals are now well supplied with nurses, and patients would receive more attention than is provided in many isolation hospitals. The X-ray department, the surgical department, the dietetic department, good laboratories, etc., with which every recognized general hospital must now be equipped, would help to insure the best possible care of contagious disease patients.

For these several reasons it seems rational to recommend, except in very large cities, that infectious diseases be cared for in wards operated in connection with general hospitals. The only essential requisite is that the isolation wards be under the supervision of a resident physician who has had experience in a modern contagious hospital, and that the nursing be in charge of a graduate nurse skilled in the nursing care of infectious diseases and in the technic necessary to prevent the spread of infection in a hospital.

DISCUSSION

W. S. Rankin, M.D., Duke Endowment, Charlotte, N. C.—As Dr. Richardson has brought out very well, this new idea of treating infectious diseases in the specially designed wards of general hospitals has resulted from changing our idea from atmospheric infection to the infection by things and persons, as has been so well preached in this country by Dr. Chapin.

Dr. Richardson limits his recommendation of these wards for the treatment of infectious diseases in connection with general hospitals to the smaller communities of this country, because in the larger cities the advantage of special hospitals for the treatment of contagious diseases is well recognized.

The advantages of this method to the smaller communities and cities of 100,000 population and less might be summarized as follows: First, the patient with an infectious disease has the advantage in a general hospital of more adequate diagnostic and treatment facilities with reference to both personnel and equipment, such as laboratories, dietetic department, and X-rays. The resources there are more abundant and more varied than could be found in a general hospital. That is the advantage to the patient.

Second, there is a distinct advantage to the nurse, in the matter of training. Most nurses are trained in the general hospitals of this country, and unless those general hospitals have departments for treatment of contagious diseases, the larger percentage of nurses fails to receive training in this most important branch of nursing. Another advantage to the nurses is the professional technic attained, for dealing with contagious diseases brings about a refinement of technic and a higher ideal of cleanliness than they would otherwise have.

Third, the advantages to the doctors: The majority of internes are now serving in general hospitals where they acquire no experience in the treatment and handling of contagious diseases. Their interest in contagious diseases is, therefore, less than it would be if they were more intimately associated with this problem in their earlier years. Those who are interested in tuberculosis have come to the conclusion in recent years that the too far separation of the problem of tuberculosis from that of the general practitioner has not resulted in the greatest good to the largest number. Tuberculosis has been so far separated in its treatment from the general problems of medicine that many of the doctors of this country have ceased to think of tuberculosis as a part of their work; and the tendency now, and a tendency promoted by the leaders in the movement of tuberculosis work, is to bring the problem back closer to the general practitioner, in order to bring about new interest and develop and renew his interest in the problem. This same principle applies to this problem of contagious diseases. If we are to preach here isolation of the treatment of contagious disease, a thing separate and apart from general medicine, general medicine will more and more lose its interest in contagious disease, feeling more and more that it is somebody else's problem, a problem of the specialist. So, this bringing together of this special problem with the general problem of medicine in these general hospitals does the two things—it permits the training of internes in the treatment of contagious diseases and it develops a larger and deeper interest on the part of medicine in general in this group of diseases.

For more than half the population of the United States, unless this principle has the endorsement of leaders in public health work and in medicine, it becomes more or less impossible to develop any sort of hospital facilities for the treatment

of contagious diseases, because cities of 100,000 population and less cannot be expected to have special hospitals for contagious diseases, because many of these places have no general hospital.

Haven Emerson, M.D., New York, N. Y.—The advice of Dr. Richardson, though preëminently important for the smaller communities, is a matter of very great economic consideration to the larger cities as well. Not more than 14 per cent of the beds for contagious diseases in large cities of the country are actually occupied by communicable diseases during the year now. That was the report for 100 cities in the United States of the year 1925, and there is no reason to believe the situation has improved since that time.

Charles V. Craster, M.D., Newark, N. J.—I am just wondering whether those special hospitals with empty beds could not be used for the treatment of ordinary medical and surgical cases. Why should these hospitals be empty? If contagious diseases can be handled in the general hospital, why should not other diseases be handled in an isolation hospital?

Arlington Ailes, M.D., La Salle, Ill.—We have an isolation ward which, as Dr. Emerson points out, has been little used, and the result is that funds to cover its operation have been lowered so that we cannot keep it up adequately; and, as a result, a vicious circle has been established. The number of patients being sent there has been reduced because we cannot keep it up. A certain hospital wants to take it over for a nurses' home, and build an addition to the hospital to take care of communicable diseases, but they hesitate on this matter of admitting smallpox cases. I would like to know whether I can go back to those people and recommend that they can safely admit, into the general hospital, smallpox cases.

James A. Hayne, M.D., Columbia, S. C.—I would like to say that as far as that policy is advocated, the Roper Hospital in Charleston which is one of the oldest in the country has always pursued the plan of taking the smallpox cases, scarlet fever or any others, including tuberculous patients, and it is still pursuing that policy.

E. L. Bishop, M.D., Nashville, Tenn.—I should like to ask Dr. Richardson to define his generalization for the size of the communities. I would like to know what he believes is the dividing zone.

Dr. Richardson—In reply to Dr. Bishop's question, if I understood it correctly, we arbitrarily selected the size of the community as 100,000. A community of that size should have isolation hospital facilities of something like 150 beds. I mean, particularly, if the isolation hospital is going to be required to accept various kinds of infectious diseases, that a hospital of 150 beds or less is not economical to maintain. There are many of the smaller isolation hospitals in the country that are not only empty part of the year, but are empty for even a year or two at a time. So far economic reasons a hospital of, say, less than 150 beds should not be maintained as a separate institution. I think perhaps even a higher figure ought to be set.

In Providence we have admitted smallpox cases since about 1912 or 1914. Since the pesthouse was done away with by fire, to make way for a railway extension, we have admitted these cases to our best equipped isolation ward, in which we very often have private patients. The only precaution we take is that we always keep our nurses and hospital personnel vaccinated up to date, and at the time the patient is admitted to the ward we vaccinate all patients in that ward. We have not made a practice of vaccinating patients in other wards.

I just want to stress one other thing, and it is this: By 1890, London and

some of the other English cities admitted as many as 90 per cent of the two diseases, scarlet fever and diphtheria. When they began this building program in the 70's, they hoped to stamp out those two diseases by hospitalization. The result has been that even though they have hospitalized 90 per cent of the recognized cases of diphtheria and scarlet fever, both these diseases are just as prevalent as they ever were. It might be fair to say the mortality has greatly decreased.

But it is perfectly obvious that hospitalization alone is never going to stamp out infectious diseases, and that isolation is not the only function of an isolation hospital. It should be a place where patients who cannot receive the proper attention at home, and who live under circumstances where isolation cannot be carried out properly, are admitted to the hospital not only with the idea of isolation, but of giving them the very best possible treatment. This idea has not always been carried out in this country or in Europe.

I want to stress one other thing. By admitting a large variety of diseases, particularly diseases common all the year around, or even more common in the summer, you can keep your hospital beds much better occupied than if you keep seasonal infectious diseases.

Harmon Publicity Awards

THE Harmon Foundation, in consultation with the Social Work Publicity Council, offers four awards of $100 each for a complete record of a well planned and executed program covering a year's work in publicity carried on by a public or private agency engaged in social or health work. These will be as follows: $100 for the best record submitted by a national agency; $100 for the best record submitted by a state or regional agency (a regional agency is here taken to mean an agency in any geographical grouping not otherwise specified); $100 for the best record submitted by an agency in a city or county of 200,000 or more population; and $100 for the best record submitted by an agency in a city or county of less than 200,000 population.

In addition to the above awards for a year's publicity record the Harmon Foundation, in consultation with the Social Work Publicity Council, also offers awards for unpublished articles on social work. These are $300, $200 and awards of $50 each, to go for the best unpublished articles in which social work is popularly presented with a view to publication in a magazine of general circulation.

Write Harmon Foundation, 140 Nassau St., New York, N. Y., for conditions.

Cereals and Their Products*

THE Committee on Cereals and their Products was added to our list of standing committees at our Buffalo meeting, held in 1926. Since no report was submitted last year, it seems desirable at this time to advance certain suggestions relative to the types of reports which should be rendered and also to indicate subjects which merit consideration. Since the primary object of our Section is to consider foods from the public health point of view, it is obvious that our survey of the cereal field should stress the food value of these materials, consider their keeping qualities or freedom from deteriorative and even harmful changes, gather information on their combination with other foods, summarize our present scientific knowledge of their place in our food economy, study the effect of manufacturing processes on their value as foods, stimulate research, and, finally, should present a fair evaluation of these food substances in the light of the available scientific evidence.

Such a program should produce a series of reports of value to those interested in the food and nutrition field and also to manufacturers and distributors directly concerned with these commodities.

With the foregoing principles in mind, we believe the following subjects are worthy of study:

1. The nutritional value of bread
2. The protein value of cereals
3. The vitamin content of cereals
4. The germ of cereals
5. The value of cereal bran
6. The deterioration of cereals
7. The mineral content of cereals
8. Manufactured or prepared cereals
9. Cereal breakfast foods
10. Sanitation of cereals and cereal products

For this year's report we have chosen the nutritional value of bread, for the reason that bread plays such an important rôle in our diet. Further, bread itself and the various ingredients entering into its composition have long been the objects of scientific study, especially with each new advance in the science of nutrition.

A critical review of the earlier contributions in the study of bread

* Report of the Committee, presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

and bread components will not be undertaken since these are adequately covered by the more recent books in the food and nutrition field. Instead it has seemed advisable to confine our discussion to the contributions of the past seven or eight years and to note the present status of our scientific opinion on the nutritional value of this important foodstuff.

In order to indicate the magnitude of our bread consumption, recent statistics may be of interest:

The production of flour required for consumption in our country amounts to approximately 107,000,000 barrels per annum.

Of this amount nearly 5,000,000 barrels are used by biscuit and cracker manufacturers, somewhat over 2,000,000 bbl. by the macaroni industry and 10,000,000 bbl. for self-rising flour, leaving a little over 90,000,000 bbl. available for bread, cake, pastry, etc., made by bakers, hotels, restaurants and in the home. According to the 1925 reports of the U. S. Bureau of the Census, the baking industry used 40,500,000 bbl. of flour for all purposes. This includes 37,700,000 bbl. of wheat flour and 2,800,000 bbl. of rye and other flours. The amount of wheat flour used in the home, restaurants and hotels is therefore approximately 52,000,000 bbl. Of this quantity, approximately one-half is used for bread and one-half for pastry and other purposes, indicating that 26,000,000 bbl. are consumed for bread by these agencies. Of the bakers' wheat flour supply, fully 80 per cent is for bread and totals 29,000,000 bbl. Therefore the total flour used for bread by all agencies reaches 55,000,000 bbl. per annum.

The rôle of bread in nutrition is important since it furnishes about 40 per cent of our total calories and about 30 per cent of the total proteins.

In a symposium on bread held by the American Chemical Society in 1923, two important papers on the nutritional value of bread were presented. In one of these Hale[1] presented the results of animal experimentation with commercial white bread, commercial whole wheat bread, and a special bread made with wheat flour, whole milk, a wheat embryo extract, and added calcium. In the case of both the commercial white and whole wheat breads, with one exception, in all his series, they were very deficient from the standpoint of securing adequate nutrition from a single food substance. The exception was with a bread actually made from whole wheat. He pointed out further that most so-called whole wheat flour is a degerminated and partially decorticated flour. The special bread gave results in excellent agreement with those obtained by feeding his rats on normal food.

Hoffman[2] made an exhaustive study of the reproduction of animals

on an exclusive diet of bread which was of the same type as the special bread used by Hale. He obtained normal growth, health and reproduction with both mice and rats when reared on this bread and water. Observations on children fed this bread confirmed the results of the animal experimentation.

In an article published in 1925, Wood,[3] of Cambridge, asks the question whether "modern white bread is a worse food than bread made from stone-ground flour." He pointed out that bread protein is fairly well digested, that bread contains only a small proportion of fat and ash, the latter also being poor in phosphorus and calcium. The Cambridge experiments showed that 96 per cent of the calories contained in bread made from patent flour were digestible whereas 90 per cent were digestible in the breads made from stone-ground flour from which about 12 per cent of bran had been sifted.

Hindhede,[4] the Danish physiologist, showed that bread protein has the same biological value as the protein in meat and milk.

Sherman,[5] in a study of the protein requirement of maintenance in man and the nutritive efficiency of bread protein, stated: "It does not seem necessary to discriminate against bread protein as compared with the protein of staple foods in general in so far as the requirements of adult maintenance alone are concerned."

Eddy[6] has shown that milk added to bread increases the calcium and vitamins and thus reduces the deficiency of white bread in these essentials. Johns, Fink and Jones[7] described the making of a nutritionally balanced bread, utilizing peanut flour or soy bean flour.

Hartwell[8] kept animals on a diet of white bread, butter and a salt mixture for a year without showing symptoms indicative of lack of vitamin B.

Hawk, Smith and Bergeim[9] secured better growth in rats with standard bread to which 5 per cent yeast powder had been added than without this addition. In each experiment the bread was supplemented with butter and a salt mixture, but the growth obtained was below the normal rate.

Miss Gault[10] found that bread made with 6 cakes of yeast to a loaf nourished rats much more effectively than bread made with ½ cake of yeast to a loaf. The extra yeast supplemented both the water-soluble vitamin and the protein.

Nelson and Nelson[11] made a critical study of vitamin B in yeast bread and concluded that "yeast bread, as it is usually made, contains little vitamin B. Rats kept on a diet adequate in all respects except in vitamin B, and containing 75 per cent of yeast bread, failed in all cases and developed polyneuritis."

Swanson[12] states that the mineral deficiency of wheat flour in calcium, phosphorus, sodium and chlorine must be made good by the inclusion of milk and certain vegetables in the diet and that the wheat proteins are best balanced by those from milk, eggs and meat. These balancing foods also supply several of the vitamins.

McCollum and Simmonds[13] express the following opinion:

Whole wheat bread, while superior to the bread made from refined flour, is not so satisfactory a source of the several nutrient principles necessary to make as satisfactory a diet as is a combination of suitable proportions of white flour with either of the protective foods, milk or the leafy vegetables. Therefore it seems logical and sane to assert that the choice of flours may safely be left to the consumer, provided there is a full understanding of the necessary precautions in the selection of foods.

In an editorial[14] discussion of the subject of "Whole Wheat versus White Bread," Osborne and Mendel[15] are quoted as follows:

Whenever bread made from highly milled flour forms an unduly large proportion of the diet of children, the vitamin deficiencies may lead to malnutrition. In this country there is relatively little occasion to be concerned on this score, because the food habits of our people are such as to make cases of this kind comparatively rare.

Summarizing our present knowledge of breads made from white and whole wheat flours, it may be stated that white bread is deficient in vitamins, certain essential minerals, and the protein needs supplementing. Whole wheat bread is also deficient though to a lesser degree and also is not quite so digestible. Both are incomplete foods and require the supplementary use of milk and leafy vegetables. Notwithstanding these shortcomings, bread supplies a very large part of our calorific requirement.

As Eddy[6] has expressed it, "The preëminence of bread in the diets of western nations is recognized as well-justified by dietetic and economic considerations."

F. C. BLANCK, PH.D., *Chairman*
E. V. MCCOLLUM, PH.D.
D. BREESE JONES

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EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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MILK IN NUTRITION

WE have commented upon the preliminary report of the tests conducted by the Scottish Board of Health on the feeding of a large number of school children.[1] The results were so important that the experiment was continued, and the second preliminary report is now before us.[2]

The study was carried on at seven centers, the number of children concerned being 1,425. At each center the children were divided into four groups, one of which received whole milk, one separated milk, one a biscuit ration having the caloric value of the separated milk, while the fourth acted as controls, receiving no special diet. The whole milk averaged 3.85 per cent butter fat and the separated milk 0.33 per cent. Measurements were made four times, except at Belfast, where only three were done. The work was carefully controlled and every effort made to obtain accurate average results, taking into consideration the difference between the winter clothing worn at the beginning and the lighter clothing at the end of the study.

The results have more than justified the conclusions drawn from the first set of experiments. For all ages the great value of a milk ration given at school in addition to that used at home was clearly demonstrated. Combining the milk-fed groups, the average increase in height was 1.21 per cent more than in the first test, while the increase in weight was 3.75 per cent greater. In the milk-fed group, all ages combined, the average increase in height was 23.5 per cent, and in weight 45.37 per cent over the non-milk-fed group. Children who took part in both tests showed the benefit of the ration to an even greater extent than in the first test, their improvement continuing over the second year.

An interesting feature is the comparison of the groups receiving separated and whole milk. For most of the groups, there is no "significant" difference, but in the 6-year old group, whole milk gives "significantly" better results for both weight and height. In all groups, those receiving milk, either separated or whole, showed better results than those receiving the biscuit ration or the controls. The difference between those receiving the extra biscuit ration and the controls is practically negligible.

Once again the value of milk has been conclusively shown, and while skimmed milk gave excellent results in the second as well as in the first experiment, it must be remembered that it supplemented a certain amount of milk received by these children at home, and the conditions do not furnish a clear comparison between the value of whole and separated milk. There is no question that whole milk is a more complete food than separated milk, but the experiments certainly demonstrate, as pointed out in the first preliminary report, that the latter is an excellent article of food, and in countries like England, where the expense of whole milk and butter is practically prohibitive to many of the poorer class, it supplies a wholesome and nutritious food, which, supplemented by small amounts of fresh vegetables, makes an adequate diet.

The conclusions drawn from this, as well as other similar investigations, strengthen the opinion that milk is the single most perfect food, and is a primary factor in the growth and nutrition of children. The campaign for the increased use of milk by children and adults alike is based on sound facts. We still need to push our efforts for clean milk, and we should draw a distinction between pasture milk and stall-fed milk, which does not have the same value unless the stall-fed animals are specially dieted.

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THE DEATH OF FERNAND WIDAL

Professor Titulaire de la Faculté de Médicine, Paris

THE death of Widal is of more than ordinary importance to laboratory workers as well as physicians on account of the agglutination test with which his name is almost universally coupled. He died from cerebral hemorrhage on January 14 at his home in Paris, and was buried at Montmartre on January 17. He was within less than two months of being 67 years of age.

As a student he showed exceptional ability, and was always attracted by laboratory work. At the age of 27, his treatise on Puerperal Infection was published. He was made professeur agrégé in 1895, and in 1896 announced the agglutination test for the diagnosis of typhoid fever which carried his name to the scientific world. It will be remembered that this test was introduced to Americans in the same year by the late Dr. Wyatt Johnston at the meeting of the American Public Health Association held in Buffalo. An unfortunate controversy took place over the discovery of the agglutination test. Though it was claimed by Widal himself, who gave a demonstration of it in June, 1896, it has been shown that Gruber of Vienna was the pioneer, and that even in publication he was preceded by Durham, who credited it to Gruber. There is no question, however, that to Widal belongs much credit, especially in making it a practical procedure. Even the Germans speak of the "Gruber-Widal" reaction.

Widal's reputation, however, was not dependent upon this work, since, either alone or with Chantemesse, he made notable contributions to cytodiagnosis, antityphoid vaccination, and the influence of sodium chloride upon edema. His publications were noted for clarity and accuracy.

He was one of the best known physicians in Paris, and had a large following of young men, chiefly on account of his clinical work, centered at the Cochin Hospital. He was noted for his excellent organization and his systematic work. He was an unusually good lecturer, speaking without notes, and always attracted a large number of hearers. He was more than usually beloved by his many students, as well as by the public, and was one of the rare men whom the world can ill afford to lose.

Widal was the recipient of many honors from his own country as well as others.

ASSOCIATION NEWS

THE JOURNAL

It is with considerable gratification that the American Public Health Association announces that the editing of the JOURNAL will hereafter be done by M. P. Ravenel, M.D. Dr. Ravenel, a past president of the Association, has been for a long time Chairman of the Editorial Committee of the JOURNAL and has contributed liberally to the editorial and book review sections. Beginning with this issue Dr. Ravenel will review all manuscripts submitted and personally edit all articles for publication. Members and others submitting manuscripts or having other occasion to correspond with the JOURNAL in reference to general editorial matters should address: M. P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Communications or notes relating to the several JOURNAL sections should be addressed to the respective section editors.

Correspondence concerning subscriptions, advertising, reprints or other matters relating to the publication office should be addressed to the Managing Editor of the *American Journal of Public Health and the Nation's Health*, 370 Seventh Avenue, New York, N. Y.

CONNECTICUT PUBLIC HEALTH ASSOCIATION

The following officers were elected at a meeting held in New Haven, January 30: *President*, C. P. Botsford, M.D., Hartford; *Vice-President*, B. N. Pennell, D.V.S., New London; *Secretary-Treasurer*, Richard W. Pullen, M.D., New Britain; *Board of Directors:* B. N. Pennell, D.V.S., New London; L. E. Poole, M.D., Fairfield; G. H. Joslin, M.D., Hamden; M. E. Culver, Middletown; Harriet Leck, Hartford; Elias Pratt, M.D., Torrington; E. H. Metcalf, M.D., Rockville; F. E. Wilcox, M.D., Willimantic.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

At the annual meeting of the Massachusetts Association of Boards of Health held in Boston, January 31, the following were elected officers of the association for the ensuing year: *President*, John J. McGrath, Salem; *First Vice-President*, M. Victor Safford, M.D., Boston; *Second Vice-President*, J. U. Paquin, M.D., New Bedford; *Secretary*, Stephen L. Maloney, Boston; *Treasurer*, Francis G. Curtis, M.D., Newton; *Executive Committee*, E. H. Trowbridge, M.D., Worcester; L. A. Jones, M.D., Norfolk; J. R. Sackett, Springfield; G. H. Lennon, Haverhill; J. R. Glennon, New Bedford.

GEORGIA HEALTH OFFICERS' ASSOCIATION

The Georgia Health Officers' Association met at Atlanta, Ga., January 25 and 26, with Dr. H. L. Akridge, President, in the chair.

The following officers were elected for the year 1929: *President*—Gordon T. Crozier, M.D., Commissioner of Health, Valdosta; *Vice-President*—B. V. Elmore, M.D., Commissioner of Health, Rome; *Secretary-Treasurer*—Victor H. Bassett, M.D., City and County Health Officer, Savannah.

The association voted to make application for election as an Affiliated Society of the American Public Health Association.

NEW MEMBERS

Philip H. Bartholome, M.D., Lincoln, Neb., State Director of Public Health

Margaret Beattie, Berkeley, Calif., Assistant Professor of Public Health, University of California

L. D. Boone, M.D., Langley, S. C., Member Executive Committee, State Board of Health

Henry R. Buck, Ph.B., Hartford, Conn., Sanitary Engineer

John R. C. Carter, M.D., C.M., Harrisonburg, La., Director of Parish Health Unit

Walter B. Carter, LL.B., Washington, D. C., Statistician, U. S. Government

Francis E. Colien, B.S., M.S., Milwaukee, Wis., Bacteriologist, School Health Work, Director, Department of Bacteriology, Vocational School.

M. D. Cure, M.D., Weston, W. Va., County Health Officer

Walter W. Davis, A.B., Ph.D., Seattle, Wash., Supervisor of Hygiene in Public Schools

William Egleston, M.D., Hartsville, S. C., Member Executive Committee, State Board of Health

Davis Furman, M.D., Greenville, S. C., Member Executive Committee, State Board of Health

Lloyd R. Gates, B.S., Ann Arbor, Mich., Graduate Work in Public Health (Assoc.)

Clara E. Gilbertson, R.N., Wheeling, W. Va., City and County Tuberculosis Nurse

Lloyd M. Graves, Memphis, Tenn., City Health Officer

Schubert D. Henry, M.D., Kansas City, Kans., Director of Health

Charles Hunt, M.D., Clinton, Ky., County Health Officer

M. D. Ingram, M.D., Dresden, Tenn., County Health Officer

William A. Kelley, Ph.G., Philadelphia, Pa., Instructor of Chemistry, Temple University

Paul J. Lewis, B.Sc., Scottsbluff, Neb., Director of Branch Laboratory, State Department of Health

Dorothy Lottridge, M.D., East Orange, N. J., Medical Inspector of Schools

Charles B. Maits, B.S., M.D., Pittsburgh, Pa., Director of Health

George F. Manning, M.D., Flagstaff, Ariz., City and County Health Officer

C. H. Munger, M.D., Oskaloosa, Kans., Field Agent, U. S. Public Health Service

Arthur Noack, Hackensack, N. J., Consulting Municipal Engineer

William L. Orr, M.D., Louisa, Ky., Health Officer

Hal H. Puckett, Fayetteville, W. Va., County Health Officer

Anne Raymond, R.N., New York, N. Y., Field Representative, School Department, Cleanliness Institute

William R. Redden, New York, N. Y., Associate Health Director, Cleanliness Institute

Edgar T. Riley, M.D., Frenchburg, Ky., Health Director of Menifee County

Murrell O. Robinson, V.M.D., Philadelphia, Pa., Director of Laboratories, Scott-Powell Dairies

F. M. Routh, M.D., Columbia, S. C., Member of the Executive Committee of the State Board of Health

John Schreiber, M.D., Vidalia, La., Director Concordia County Parish Health Unit

Joseph E. Smith, M.D., Windsor, N. C., Health Officer of Bertie County

W. R. Wallace, M.D., Chester, S. C., Member Executive Committee, State Board of Health

Paul A. Watson, B.S., Pasadena, Calif. (Assoc.)

W. H. Wheeler, M.D., West Liberty, Ky., Director of Morgan County Health Department.

Maysil M. Williams, M.D., Bismarck, N. D., Director, Division of Child Hygiene, State Department of Health

Alice H. Wilmarth, B.S., Ellensburg, Wash., Director of Health Education, Washington State Normal School

Robert Wilson, Jr., M.D., Charleston, S. C., Chairman, Executive Committee, State Board of Health

Charles L. Woolley, Glen Rock, N. J., Executive Secretary, N. J. Public Health and Sanitary Association

DECEASED MEMBERS

C. B. Ball, Chicago, Ill. Elected member 1910—Fellow 1922

Alonzo B. Foster, M.D., Fonda, N. Y. Elected member 1926

John L. Gray, M.D., Caldwell, O. Elected member 1927

B. F. Lowry, M.D., Cleveland, O. Elected member 1920

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Spread of Scarlet Fever—A study has been made of the relation of carriers of hemolytic streptococci to family infection of scarlet fever. Throat cultures and Dick tests were made on every member of the household in which scarlet fever occurred. It was observed that in case the source of infection of the first patient could definitely be proved not to have been outside the home, some member of the household was found to carry abundant hemolytic streptococci of Beta type in the throat.

Throat cultures were made and the presence of hemolytic streptococci was expressed as follows: (+++) incalculable number of colonies; (++) more than 50 colonies; (+) less than 50 colonies; (—) no colony.

It was found that in 11 households with scarlet fever there were carriers of hemolytic streptococci. A brief outline of the carrier situation in each household is given. In one instance a 4-year old boy was diagnosed as having scarlet fever, and swab culture indicated (+++) hemolytic streptococci. A 9-year old brother also showed a (+++) hemolytic streptococci and a negative Dick test. The latter had complained of sore throat without rash for 4 days prior to the occurrence of the definitely diagnosed case of scarlet fever. Three cases of scarlet fever later developed among the younger brothers of the household and 5 cases occurred within a week among the classmates of the carrier and 6 cases among the neighbors who frequented the same public bath house.

A study was also made between the prevalence of positive cultures among convalescents and the incidence of "return" cases, from which it is concluded that convalescents may give rise to "return" cases, if they have relatively abundant hemolytic streptococci when discharged. Convalescents free from streptococci on discharge never give rise to "return" cases.—George Moriwaki, The Relationship of Hemolytic Streptococci to the Spread of Scarlet Fever, *J. Prev. Med.*, 3: 1 (Jan.), 1929.

Tuberculosis Prevention in Chicago—An enactment of the State Legislature in Illinois gives residents of cities and villages the right to determine by referendum vote the proposition as to whether they will levy a special tax to be used in the prevention and treatment of tuberculosis. At the present time the tax rate for this purpose in Chicago is 1.2 mills on each dollar of property, netting an annual revenue of over $2,000,000. This money is used for the support of the Chicago Municipal Tuberculosis Sanitarium and the clinics and field service maintained throughout the city, there being 8 dispensaries located in the congested districts of the city. In addition to these dispensaries there are a number of sub-stations which operate one-half day each week.

Each dispensary is managed by a head physician with the assistance of a head nurse. There are also part-time and full-time assistant physicians, public health nurses, a dentist, a dental hygienist, a stenographer, a clerk and a matron.

This bulletin contains a complete description of the procedure followed in the maintenance of these clinics and in-

cludes illustrations of the forms which are used and some good photographs. There are also organizational diagrams and maps of the city showing the geographical distribution of cases of tuberculosis.—*Bull. Chicago Municipal Tuberculosis Sanitarium,* Sept.–Dec., 1928.

Tuberculosis in Illinois—In 1927 the tuberculosis death rate (all forms) in Illinois was 74.8 per 100,000 population, which is just half the rate of 1880. The highest mortality is found in the southern part of the state in the district known as "Egypt." The report not only gives the tuberculosis death rate by sex and age but also by counties from 1918 to 1928 inclusive. Contrasted with such maps is one which portrays the annual per capita expenditure for public tuberculosis work, from which it is seen that the expenditures are higher in the northern part of the state where the death rate is lower.

Sanatoriums and clinics are needed in the future tuberculosis program as likewise more attention to the pasteurization of milk and the organization of tuberculosis units coupled with additional publicity and education. The program for the eradication of tuberculosis in animals is progressing and the number of accredited counties is increasing annually.—*Ill. Health Quart.,* Jan.–Mar., 1928.

Survey of Public Health Activities in Montreal—Under the guidance of the Montreal Anti-tuberculosis and General Health League, a survey of the community health activities in Montreal has been completed. The Committee on Administrative Practice of the American Public Health Association was engaged in a consultant capacity, and the report has been printed by the Metropolitan Life Insurance Company.

Based upon the *Appraisal Form* (2d ed.) Montreal scores 624 points out of a possible 1,000. The survey follows the general outline of the *Appraisal Form* and concrete recommendations are made for each division of service.

The major recommendations, however, suggest the appointment of a board of health; provision for an adequate budget for the health department, to make possible a proper school health service, laboratory service, communicable disease control and other essential services. The continued coöperation of the voluntary health organizations is to be encouraged.

In 1927 Montreal spent 39 cents per capita for its Municipal Health Department. It is recommended that this expenditure be increased to 91 cents per capita in order to make possible the establishment of those services which are considered essential to the maintenance of a modern health department.—Survey Public Health Activities of Montreal, Oct., 1928. (Available through American Public Health Association.)

State vs. Municipal Control of Milk Supplies—In both Canada and the United States, the control of milk supplies is in the hands of the municipalities. Such control may be satisfactory in the larger cities where health education is advanced sufficiently to induce the public to demand the best article. Outside the larger cities, in the towns and villages, municipal control of milk supplies is a failure. A great deal of education and moral suasion are expended by health departments in the endeavor to have the local authorities enact the by-laws necessary and, that done, to have these by-laws enforced. The consequence is that the local milk supplies in the smaller places are anything but satisfactory.

As a rule there is more or less state or provincial control of water supplies, with the result that, in most places, the water is safe for use. There is supervision by officers of the state or pro-

vincial health authorities and the presence of contaminated water in a municipality is at once checked up and corrected.

Why not a similar control of milk supplies? The writer has consistently advocated this reform for some years, with, he regrets to say, little result. It has the backing of Ontario Milk producers and of all who are conversant with the present situation in regard to milk production and distribution. Education of the public in health, while slow, is a powerful factor in the improvement of milk supplies. Education of legislators is quite as necessary and important.—John W. S. McCullough, M.D.

ANNUAL REPORTS AT A REASONABLE COST

W. W. BAUER, M. D., FELLOW A. P. H. A.

Commissioner of Health, Racine, Wis.

ANNUAL reports are a necessity from the administrative and educational standpoints for every health department. At the same time the cost of printing is high, especially where tabular matter, charts and illustrations are necessary, and without these no annual report is satisfactory.

The Racine Health Department in 1924 tried the experiment of combining printing and mimeograph reproduction for the publication of the annual report. The cover is printed and the binding of the report is done professionally. The remainder, except for illustrations and charts, is reproduced in the office of the health department on the mimeograph. The charts are reproduced either by the blueprint or black-line process. They are first drawn on draftsman's vellum paper, and the legends and figures entered on the typewriter using pencil carbon with the black side toward the chart, thus impressing the letters and figures on both sides of the paper to insure sufficient opaqueness for a clear blueprint or black-line negative.

The necessary equipment is nothing more than a typewriter and a mimeograph with slip-sheeting device. Typewriter type must be cleaned frequently with a copper wire brush to keep the impressions sharp. Stencils must be fresh stock. Ink pads on the duplicator must frequently be changed.

In addition to the costs for material and service, which are tabulated below, the 1928 annual report of the health department required the equivalent of 8 days uninterrupted time of one operator in cutting 63 stencils and 3 days uninterrupted time of one operator for running 125 copies of each. The time involved in preparing the data has not been estimated because it is part of the administrative duty of the department and represents work which should be performed whether a report is published or not.

In many instances material which has been used for other purposes can form a part of the annual report if its use for that purpose is kept in mind throughout the year. For example, in preparing circular letter enclosures, it is frequently possible to design them of such size and arrangement as will make them available for inclusion in the annual report, thus making the cost for the latter purpose practically negligible, since 100 or so additional copies of material already on the press cost very little.

Taking for example the 1928 annual report, the cost of which ran slightly higher than the table of estimates shown in that report itself, because of unfore-

seen wastage and added length, we get the following figures:

Grade A white bond paper, 16 reams @ $1.60	$25.60
Cover-stock, printing and binding	29.75
Folded page of illustrations *	3.00
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Stencils, 2¾ quires @ $3.25	8.95
	$82.30

The prompt availability of annual reports is of the utmost importance. It is much easier to compile the wanted data monthly and then simply to add up a few figures at the end of the year than to let it all accumulate to be done at one time. We prepare in January each year a set of folders in which data for our various activities are compiled at the end of each month. Thus we have one folder for educational activities, one for nursing, one for vital statistics, one for milk inspection, one for meat inspection, one for the garbage division, one for the hospital, one for sanitary inspection, one for infant death study and special folders for the annual diphtheria prevention and smallpox vaccination campaigns. There is also a special folder for entering the public addresses and lectures given by members of the staff, in which we keep the date, the topic, the name of the group addressed and the number of persons reached. This gives us the data for our annual appraisal complete by January 10 without undue pressure on the organization. The only appraisal data for which we sometimes have to wait are those which come from outside the health department. Even for these we have induced the American Red Cross to keep monthly folders prepared by us for the infant and preschool work which they perform and we keep a list of necessary data from without the department so that we may write letters requesting this material about December 20 each year.

* Engravings for these pages were loaned by *The Survey*, New York, after publication of this material in their magazine.

Captain Cook and Scurvy[1]

THE credit for the discovery of the prevention of scurvy which is generally given to Captain Cook appears to be due to a physician, Dr. MacBride. Captain Cook deserves the highest commendation for his intelligent practical application of the suggested methods.

The "Endeavour" left Plymouth on 26th August, 1768. Twenty-seven days previous thereto the Lord of the Admiralty wrote to Lieut. Cook: "Whereas there is great reason to believe from what Dr. MacBride has recommended in his book entitled 'Experimental Essays on the Scurvy and other Subjects,' and his pamphlets entitled 'An Historical Account of the New Method of Treating the Scurvy at Sea' (of which you will herewith receive copies), and from the opinion of other persons acquainted with scorbutic and other putrid diseases: and whereas we think fit experiments should be made of the good effects of it in your present intended voyage, and have with that view directed the Commissioners of the Victualling to put a quantity on board barque you command. . . . " There follow directions for the making of the infusion of wort and the prescription of a quart a day. The surgeon is to keep an exact journal of the effects of the wort in scorbutic and other putrid diseases . . . noting down . . . the cases in which it is given, describing the several symptoms and relating the progress and effects from time to time, "which journal is to be transmitted to us at the end of the voyage."[2]

REFERENCES

1. See also Opportunities Missed by Physicians, Editorial, *A. J. P. H.*, 18, 11: 1394 (Nov.), 1928.

2. Purdy, J. S., Medical Officer of Health, Sydney, N. S. W. "*Captain Cook and the Prevention of Scurvy*," *Med. Off.*, Dec. 22, 1928, p. 270.

LABORATORY

C. C. YOUNG

A PRESUMPTIVE TEST FOR TULAREMIA

THOMAS G. HULL, PH. D., FELLOW A. P. H. A.

Chief Bacteriologist, Illinois Department of Public Health, Springfield, Ill.

THE following directions are given by Francis of the U. S. Public Health Service for making tularemia antigen. These have been available in mimeographed form but have not been published otherwise, hence are given below. The organism used is *Bacterium tularense* No. 38, which was isolated by Francis from a human case in Utah in 1920. Since August, 1921, it has been grown exclusively on artificial culture media and is now non-virulent for guinea pigs and rabbits.

CULTURE MEDIUM FOR BACTERIUM TULARENSE

Blood glucose cystine agar

Fresh beef infusion agar, containing 1.0 per cent peptone, 1.5 per cent agar, and 0.5 per cent sodium chloride, adjusted to a pH of 7.3 is kept on hand in stock. When needed, there is added to the stock agar 0.5 per cent of cystine and 1.0 per cent glucose, and this is heated in an Arnold steam sterilizer sufficiently long to melt the agar and to sterilize the cystine and glucose, after which it is cooled to 40 to 45° C., when 5 to 8 per cent defibrinated rabbit blood is added. Overheating and loss of the bright red color should be avoided. The medium is then tubed, slanted and incubated to insure sterility.

The addition of cystine does not change the pH of the medium, but if cystine hydrochloride is substituted for cystine, a correction may be necessary on account of acidity. Cystine is not very soluble in the beef infusion peptone agar, and for that reason it should be pulverized before being added; even then, visible particles settle in the medium.

Tubes in which the water or condensation has evaporated are preferable. The organism scarcely grows in a liquid medium. Freshly prepared tubes with moist surface and with abundant water of condensation should be allowed to stand with cotton stoppers, in a slanted position, in the incubator at 37° C. for about 1 week, until almost free of water of condensation. They are then stood upright and plugged with cork stoppers soaked in a very hot mixture of 1 part vaseline and 2 parts paraffine, to prevent further evaporation; then they are stored in the cold room.

Stock cultures are kept in the cold room and transferred every 2 months. Cultures are stoppered with cotton during 2 or 3 days of incubation but with paraffine cork during 2 months in the cold room at 5 to 10° C., preferably 5° C.

A large loopful of growth is carried over when making transfers. A control tube of plain agar should show no growth.

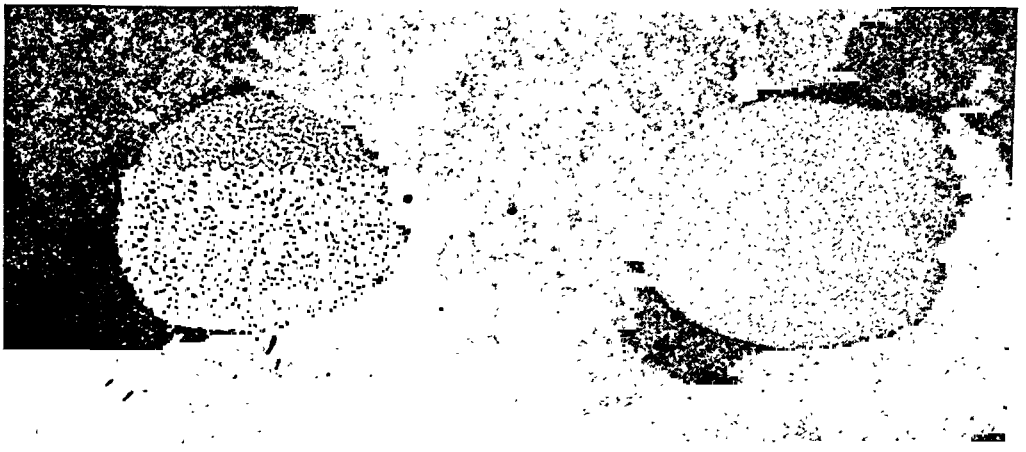
The blood in the medium conduces to luxuriance of growth and to longevity of life of the culture; 8 per cent is preferable to 5 per cent. Human blood might be more accessible than rabbit blood and might serve equally well.

MAKING THE ANTIGEN FOR AGGLUTINATION TESTS

Blood is omitted from the medium when growing antigens for agglutination or absorption tests. The medium then becomes glucose cystine agar.

Blake bottles containing glucose cystine agar are employed when a large quantity of antigen is desired. Before being inoculated the bottles should dry several days in an inverted position in the incubator, and any water of condensation should be pipetted off before inoculation. Each bottle is inoculated with the entire growth from a blood glucose cystine agar slant suspended in 1 c.c. of physiological saline solution. This suspension is quickly spread over the surface of the medium in the Blake bottle by rocking the bottle in the hands, all excess of fluid being absorbed by the dry medium.

Incubate the bottles in their normal non-



Positive *Negative*

SLIDE AGGLUTINATION TESTS FOR TULAREMIA

inverted position at 37° C. for 3 days. Take off the growth of each bottle in 15 c.c. of physiological saline solution containing 0.2 or 0.3 per cent of formalin (U. S. P. strength, 37 per cent). Throw down the bacterial mass in the centrifuge, thereby washing the organisms. Pour off the fluid. Take up the bacterial mass in saline containing 0.2 or 0.3 per cent formalin. This concentrated stock suspension has been found to be entirely reliable for agglutination tests even after storage for 2 years in the cold room. Portions of the concentrated suspension are diluted at the time of use with saline solution to the desired turbidity, using any method of determining the turbidity, the simplest, cheapest and most practical of which is the silica standard.

THE PRESUMPTIVE TEST

One drop of concentrated antigen is mixed on a glass slide with one drop of serum, either diluted or undiluted. Within 30 to 60 seconds the reaction is usually complete, as easily determined when the slide is tilted back and forth against the light. This method does not give reactions in as high dilutions as the slow test in tubes because the material dries up too soon. Protected from drying by a vaseline ring and cover glass, however, the results are almost identical by the two methods. Dried blood submitted on foil may be moistened with distilled water and tested with very satisfactory results.

The accuracy of the test is high. In no case has it been known to give false positives. In one instance it gave a negative reaction in a very weak serum (1:15 highest titer by slow method). In another instance it gave a positive reaction in an undiluted weak serum that was missed by the slow method because the lowest dilution was 1:20. All specimens are tested with abortus antigen for undulant fever by the Huddleson slide agglutination method. Occasionally cross agglutinations are encountered, but when these have been worked out they have always been, in our experience, cases of tularemia instead of undulant fever.

The presumptive test is followed by the slow test for purposes of confirmation, using 0.3 c.c. of various dilutions of serum with 0.3 c.c. of diluted antigen. Incubation in the water bath at 37° C. for 2 hours is usually sufficient but subsequent standing overnight in the icebox makes the reactions more clear-cut.

STANDARDIZATION OF LABORATORY RECORDS AND APPRAISAL VALUES *

THIS committee appointed at the 1927 annual meeting of the Association was requested to offer suggestions to the Sub-Committee on the Revision of Appraisal Form for City Health Work of the Committee on Administrative Practice before the new edition of the *Appraisal Form for City Health Work* was printed.

Your committee held three meetings and carried on a lengthy correspondence. Although failing to cover the entire field for which they were appointed they have concentrated on the subject of municipal laboratory appraisal values, making suggestions that have led to changes, which they believe improvements, in the Third Edition (1929) of the *Appraisal Form.*† Some changes are embodied in the form itself while others are in the nature of clarifying footnotes. Important changes may be listed as follows:

1. A definition of a "specimen" was made and credit based on the number of actual specimens submitted.

2. A method was devised whereby credit could be obtained for "additional reportable results" on specimens subjected to more than one examination.

3. The standards for diphtheria, typhoid and tuberculosis were changed from the basis of "annual deaths" to the basis of "annual resident deaths" and adjusted to conform to past experience of a selected group of cities.

4. The standards for gonorrhea and syphilis were changed from the basis of cases reported to a population basis.

5. The standard for milk was changed from a basic standard for all classes of milk to specific standards for the following classes:

a. Certified and other raw milk
b. Pasteurized milk
c. Raw milk previous to pasteurization

6. Standards for water examination were similarly changed from a basic standard for all waters into specific standards for public supplies and for semi-public supplies, such as private springs and wells, swimming pools and bathing beaches.

7. Amplification of the miscellaneous group was made to permit scoring of activities not mentioned in previous score forms.

8. Tentative standards were set up for the new item of laboratory reportable results.

9. It was provided that in states having approved laboratories, credit should be taken only for such approved services.

COMMITTEE SUGGESTIONS ON THE USE OF THE PRINTED FORM, THIRD EDITION

Section f. i. should include other raw milk sold in the city as well as certified milk.

In the note under Section f. iii., raw milk previous to pasteurization, alternative credit should be allowed for the direct microscopic count (Breed method). In scoring it should be clear that credit for total laboratory procedure, item h., should be based on the total of the three items, total specimens, other specimens, and additional reportable results, and therefore should be the sum of the figures in the first three columns.

It was the opinion of the committee

* Report of the Committee to the Laboratory Section of the A. P. H. A.

† American Public Health Association, 370 Seventh Avenue, New York, N. Y.

that credit should be taken in the third column for each "reportable" result, even though the result was not definitely "reported" to the person submitting the specimen.

RECOMMENDATIONS

1. Some method was considered of crediting the other communicable disease laboratory services: Bacillary dysentery, Intestinal parasites, Malaria, Meningitis, Plague, Pneumonia, Rabies, Tularemia, Typhus fever and Undulant fever, but the information at hand was insufficient for the setting up of tentative standards. The committee hopes that future experience will permit setting up of separate standards for at least some, if not all, of these diseases before the next revision of the *Appraisal Form for City Health Work.*

2. The committee feels that possibly more attention should in the future be paid to the scope of service offered in various laboratories instead of basing entire credit on volume alone.

3. The committee feels the problem has only been touched and recommends to the Laboratory Section that further studies are necessary in the light both of the foregoing recommendations and of the results obtained through the application of the newly revised *Appraisal Form.* Further studies should also be made of such internal laboratory changes as are necessary to arrive at uniform methods of keeping records and reporting the volume of work done, including the devising of suitable forms for this through which future scoring and comparison of laboratories can be placed on a more uniform basis.

FRIEND LEE MICKLE, *Chairman*
RUTH GILBERT
C. C. YOUNG
EDMUND K. KLINE
AUBREY H. STRAUS

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Diabetes Record for 1927—The use of insulin since 1923 does not seem to have arrested the rising death rate from diabetes. The United States, with an average death rate of 17.3 per 100,000 population for the period 1921–1925, had the highest rate among 15 representative civilized countries. Holland had a rate of 14.1 per 100,000 population, England and Wales 11.3, Italy 5.5 and Chile a rate of 2.9. In 1916 the United States had a diabetes mortality rate of 17.1 per 100,000, as compared with 12.9 for England and Wales. The rate for the United States reached a minimum of 14.9 in 1919, but subsequent to this date the rate increased to a maximum of 18.4 in 1922. It then declined to 16.6 in 1924, increasing to 16.9 in 1925 and 18.0 in 1926. The diabetes mortality rate in England and Wales has followed a somewhat similar course. It reached a minimum of 10.0 in 1920, increased to 11.9 in 1922, decreased to 10.9 in 1924, and then rose again to 11.5 in 1926.

Between 1912 and 1921 the diabetes death rate in 37 cities of the United States increased from 15.7 per 100,000 population to 18.1. In 1927 the average rate for these cities was 20.5. In a study of 22 cities of the United States during 1927 the diabetes death rates ranged from a maximum of 35.2 per 100,000 population in Concord, N. H., and 34.7 in Pawtucket, R. I., to a minimum of 4.1 in Chester, Pa., and 3.1 in Wichita, Kan.

A comprehensive study of diabetes mortality suggests a reëxamination of the original death certificates of representative areas for at least a period of 5 years. The early treatment of diabetes would be improved if accurate observations were available regarding individual weight curves from youth to middle life.—Frederick L. Hoffman, *Spectator,* 122: 27–29 (Jan. 17), 1929.

The Relative Position of Diabetes as a Cause of Death—In 1902 there were 47,491 deaths from all causes in Massachusetts. According to the International Classification of Causes of Death, diabetes with 379 deaths ranked number 21 in frequency. For the year 1910, the disease ranked 18th. There were 575 deaths, and they constituted 1.1 per cent of the deaths from all causes. In 1920 diabetes with 796 deaths was ranked number 13 on the list, and constituted 1.5 per cent of the deaths from all causes. In 1925 and 1927 diabetes ranked number 11. In 1927 there were 844 deaths from diabetes, constituting 1.7 per cent of deaths from all causes.—A. Hamblen and E. Joslin, *New England J. Med.,* Nov. 8, 1928.

Diabetic Children—In the 22 months ending July 1, 1928, there was a mortality of 2 per cent among 303 diabetic children. Thirteen living patients and 3 who died had diabetes for 10 years or longer. The average duration of the disease in 195 living patients seen prior to September 1, 1926, was 5.8 years. A diabetic heredity of 17 per cent was found in a group of 201 fatal cases, as contrasted with a heredity of 31.8 per cent found among 201 living children. Fifteen per cent of 256 children were 11 pounds or more underweight, and 2 per cent were more than 20 pounds underweight. Overheight at the onset of diabetes was on the average 2.7 inches for 100 children. Cataemia was established or continued in 93 per cent of 27 girls. No cataracts were recognized in 297 living diabetic children. Arteriosclerosis was demonstrated by the roentgen ray in 5 of 29 children. The cholesterol value among 67 per cent of 75 children was below the normal for such patients. Tubercle bacilli were found in the sputum of 1 patient among 17 examined. Evident pulmonary tuberculosis was present in 2 cases, and the chest conditions were suggestive in 16 cases. Insulin reactions were distressing but almost never fatal. Diabetic children withstood all types of infection by proper adjustment of diet and insulin.—E. P. Joslin and P. White, *J. A. M. A.,* 92: 143–146 (Jan. 12), 1929.

Diabetes Mellitus in the Negro—Since the beginning of the colored hospital of Atlanta, Ga., in 1921, of 26,858 admissions to all services, 113 have been for diabetes, giving an incidence of 4.2 per 1,000 admissions. In a series of 71 cases, 8 of the males showed an onset of diabetic symptoms between the ages of 30 and 39, whereas 11 of the female cases in the group showed symptoms during this period. Between the ages of 40 and 49, 7 males in the series and 15 females began to show symptoms, and between the ages of 50 and 59, 2 of the male cases and 12 of the female first showed symptoms. After the second decade of age, diabetes among negroes seems to appear about 10 years earlier than in the white race. In 32 cases symptoms of diabetes had been present for more than 2 years. The greatest duration was 17 years in an obese colored physician. Thirteen of the patients with diabetes of long duration experienced the onset of symptoms during the fifth decade.

Seventy cases of the series of 100 were female. This comparatively high incidence among females may be due to their marked obesity, which is one of

the most important single factors influencing the development of diabetes among negroes. Of 34 clinic cases, 76.5 per cent (3 males and 23 females) had a weight of more than 10 per cent in excess of the average standards for white individuals of the same height and age. Syphilis did not seem to be an important etiological factor. The incidence of positive Wassermann tests was 14.1 per cent. Clinical arteriosclerosis was present in 43 or 55.1 per cent of 78 patients. Among 81 patients, 36 or 44.4 per cent showed evidence of hypertension. Extensive active tuberculosis was present in 2 cases. Among 36 clinic cases, 20 received from 10 to 60 units of insulin daily. There were 25 hospital admissions of patients in a state of impending or deep coma; 14 of these patients recovered and 11 died. There were 2 deaths, 1 from tuberculosis and the other from an accident, among the 36 clinic cases. Among the hospital admissions, there were 27 deaths.

Diabetes is usually mild among the negroes, and the greatest handicap to adequate control of the disease is poor coöperation due to poverty and lack of intelligence. The same complications appear in the negro and white diabetic. Successful results in control of the disease can be obtained in the colored patient, after instruction in the general principles of diet, insulin dosage, administration of insulin and the technic of testing urine in sugar.—Harold M. Bowcock, *South. M. J.*, 21: 994–999 (Dec.), 1928.

Vital Statistics of the Irish Free State for 1927—The Registrar-General of the Irish Free State reports that there was a death rate from all causes of 14.8 per 1,000 population for 1927. This is lower than the average rate of 15.4 for the previous 10 years, but higher than the rate of 14.1 for 1926. The birth rate for the year was 20.3 per 1,000 population, being 0.05 below the average for the previous 10 years. The birth rate in Northern Ireland was 21.3, in England and Wales 16.6, and in Scotland 19.8. Infants under 1 year of age showed a mortality rate of 71 per 1,000 births, as compared with 74 per 1,000 in 1926. In Northern Ireland the rate was 78, in England and Wales 70, and in Scotland 89. The low rate in the Irish Free State is due to the low mortality in rural areas. In the city of Dublin the infant mortality rate for 1927 was 123 per 1,000 births. The increase in the general death rate was due chiefly to influenza, heart disease and respiratory diseases. The death rate from tuberculosis was the lowest on record, being 1.45 per 1,000 population. The corresponding rate in Northern Ireland was 1.41, in England and Wales 0.97, and in Scotland 1.0. Heart disease was responsible for 5,031 deaths, 375 more than for 1926. The deaths from cancer continued to increase, the total number, 3,113, being the highest on record.—Report of the Registrar-General of the Irish Free State, *Lancet*, 2: 1315 (Dec. 22), 1928.

Puerperal Septicemia in Massachusetts in 1927—A study of the 140 deaths from puerperal septicemia in Massachusetts during 1927 was made by a committee appointed by the Section of Gynecology and Obstetrics of the Massachusetts Medical Society. Questionnaires were sent to all physicians who had reported a case of puerperal sepsis during 1927, and 94 responses were received. In a group of 50 cases studied, 52 per cent of the fatal cases were delivered at home, as against 48 per cent delivered in hospitals. Forty-four per cent of the 50 cases who had operative procedure were fatal, as compared with a fatality of 46 per cent among patients with normal deliveries. Toxemia of pregnancy was evident in 10 per cent of the cases. Thirty-four per cent of the 50 cases stated there had

been antepartum care. In 24 per cent of the 50 cases, the first symptoms of puerperal sepsis appeared on the third day after delivery. Thirty-eight per cent of the cases had perineal tears, 30 per cent did not, and no information was received about the remaining cases.

There were 20 cases of incomplete abortion reported among the 94 cases. Two of these gave evidence of artificial interference with pregnancy. One case aborted after an operation for diverticulitis, and septicemia developed. Two others were cases of appendicitis associated with pregnancy. The remaining 15 cases aborted outside of hospitals, and called medical service only when they were extremely ill. These patients stayed in the hospital on an average of 6 days. There were 5 deaths from puerperal sepsis associated with cesarean section and 2 from ruptured uteri followed by sepsis.

There appears to be a definite seasonal variation of the disease. In New York State in 1914–1920 it was found that the greatest number of cases was in the month of March. In Massachusetts during 1927, May was the month of highest incidence. A considerable number of cases are infected where no examination, either internal or external, has been made. These deaths should not be charged to laxity on the part of the profession.—Report of the Committee on Survey of Incidence of Puerperal Septicemia in Massachusetts in 1927, *New England J. Med.*, 199: 25, 1253–1259 (Dec. 20), 1928.

Lengthened Life of the German Population—The mortality statistics as set forth in the new German mortuary tables for the years 1924 to 1926 may be regarded as comparatively favorable. The infant mortality rate has decreased about 44 per cent since the beginning of the 20th century. The infant mortality rates for the years 1924 to 1926 were 115.4 for males and 93.9 for females per 1,000 live births, as compared with 202.3 and 170.5, respectively, for the period 1901 to 1910. There was also a great decline in the mortality among children aged 1 to 5 years. Of 1,000 children 16.2 boys and 14.9 girls died in the second year of life, or only two-fifths as many as 20 years ago. The decrease in the mortality rates for the age groups 15 to 25 has been less marked. The mortality of 4.3 per 1,000 population among 20-year old males, and 3.3 among 20-year old females, was only about 15 and 21 per cent lower, respectively, than the average for the decade 1901 to 1910. In the next higher age groups the mortality especially among men has undergone a much greater reduction. Of 1,000 men aged 30, only 4.1 died, as compared with 5.6, the average mortality for the decade 1901 to 1910. The mortality of men aged 35 and 40 was 4.3 and 5.4 per 1,000 respectively, as compared with 7.0 and 9.2, respectively, for the decade 1901 to 1910. The reversal of mortality conditions observed in men in the 20- to 30-year age groups as against the 30- to 40-year groups has not been duplicated in women chiefly on account of the additional hazard of pregnancies. Above 50 improvement in the mortality rates becomes less with increasing age.

The marked diminution in the mortality of all age groups results in a lengthening of life of the population as a whole. The lengthening of life is most noticeable in the first 5 years of life. According to the mortality conditions of the period 1871 to 1880, the new-born males attained an average age of 35.6, and according to the conditions that prevailed during the decade 1901 to 1910, they attained an average age of 44.8. Under present conditions the average age of males is 56. During the past 50 years the life expectancy of new-born females has increased from 38.5 years to 58.8 years.—*J. A. M. A.*, 92: 576 (Feb. 16), 1929.

Tonsillectomy and Rheumatic Heart Disease—The records of 413 rheumatic children were investigated, and the children observed over a period ranging from 1 to 10 years. In 247 cases the tonsils were removed, and the remaining 166 cases served as controls. Of 245 children subjected to tonsillectomy, manifestations of rheumatic infection recurred in 47.7 per cent; and infection appeared for the first time in 34.7 per cent. There was no recurrence of infection in 17.5 per cent of the cases. In 22.8 per cent of the 245 cases the operation was performed at the age of 5 years or less. The first infection occurred in 62.5 per cent of these children after tonsillectomy. There was recurrence of infection in 30.4 per cent of these cases. The operation was performed between the ages of 6 and 9 in 47.4 per cent of the children. A recurrence of infection occurred among 50.9 per cent and the first infection occurred after tonsillectomy in 35.3 per cent of these children. Tonsillectomy was performed among 29.8 per cent of the cases at ages of 10 years and over. Of these 56.2 per cent had a recurrence of infection, while the first infection occurred after tonsillectomy in 12.2 per cent. Of the 247 children from whom the tonsils were removed, 50.2 per cent experienced recurrent tonsillitis, and 49.8 per cent experienced no recurrence. Of 166 children who were not operated upon, 48.2 per cent gave a history of recurrent tonsillitis, and 51.8 per cent gave a history of no recurrence.

The age at which tonsillectomy is performed seems to be the significant factor in the evidence of infection after the operation, but this study seems to indicate that the routine removal of tonsils for the prevention of rheumatic heart disease in children is not based on conclusive data.—M. Wilson, C. Lingg, and G. Croxford, Statistical Studies Bearing on Problems in the Classification of Heart Disease, *Am. Heart J.*, 4: 197–209 (Dec.), 1928.

Health in Uganda, Africa—A report on Uganda for 1927 was recently issued on the authority of the Colonial Office. The protectorate covers approximately 94,204 square miles. The population on December 31, 1927, was estimated to be 3,149,354. Of these, 1,867 were Europeans, 11,502 Asiatics, and 3,135,985 natives. The climate of the protectorate is not considered healthy for Europeans, and outdoor manual labor is dangerous for them.

The excess of births over deaths reported for five districts of the protectorate was 17,000. Syphilis, malaria, yaws, and ulcers are the four commonest diseases in the country. Pneumonia, dysentery, and injuries account for the largest number of deaths in hospitals. Plague and sleeping sickness required more attention than usual during the year. There are 4 government European, 9 Asiatic, 28 native, and 11 isolation hospitals in the protectorate. These provide beds for 27 Europeans, 51 Asiatics and 1,391 natives. In addition there are 97 beds in isolation hospitals which may be used for either Asiatics or natives. There were 480,514 new cases recorded as having attended the various government hospitals, dispensaries and medical centers. This is an increase of 100,117 cases over the number recorded in 1926. There were 1,111 deaths in hospitals for 1927, as compared with 1,397 in 1926. This was accounted for by the falling off in the number of cases of dysentery during the year. Grants are made by the government toward the cost of medical training of both native attendants and midwives at mission hospitals and maternity training schools.—*Lancet*, 2: 955–956 (Nov. 3), 1928.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Gas Production from Sewage Sludge—Sludge gas originates from the anaerobic decomposition of organic sewage solids. In this decomposition enzymes play an important part in accelerating the reactions involved. The gas consists mainly of methane, together with carbon dioxide and nitrogen and occasionally hydrogen, oxygen, carbon monoxide and hydrogen sulphide. Methane is formed by the decomposition of cellulose and the fermentation of alcohols. According to Söhngens it is also formed by direct reduction of carbon dioxide by hydrogen. Carbon dioxide is produced in the methane fermentation and in processes in which hydrogen is also formed.

The process of the formation of nitrogen is not clearly understood but it probably originates in the decomposition of albuminous substances. Hydrogen is produced in the process of fermentation of pectose, carbohydrates and albuminoids. It is in general not formed in the regular operation of digestion chambers since it reacts with the carbon dioxide. Hydrogen sulphide only occurs in badly operated tanks. The evolution of gas occurs between 6 and 50° C., the optimum temperature lying at 25° C. The pH should be between 7.0 and 7.6. The gas has usually the following composition: 70–80 per cent methane, 15–30 per cent carbon dioxide, 0–8 per cent nitrogen, and has a heating value of 780–900 B.t.u. per cu. ft. Separate digestion chambers are in general not suitable. The evolution of gas is increased if the digesting solids are agitated. Two story tanks are very suitable since the surface of the digestion portion is small, and the solids are kept comparatively warm by the incoming sewage. A good mixing of ripe and fresh solids is also obtained in these tanks. With separate digestion, artificial heating and mixing are usually necessary. In Germany sludge gas is used for heating and power supply, and is frequently mixed with municipal coal gas for lighting purposes.—Heilmann. Paper read before a meeting of the Verein deutscher Chemiker. *Chem.-Ztg.*, 52, 482, 1928. (From papers of Water Pollution Research Board, England.)

Municipal Work in Wakefield—A description is given of the two sewage disposal works of Wakefield at Calder Vale and Agbrigg. Both of these works are now using the activated sludge process, aeration being effected by Haworth's paddle method. The Calder Vale plant, which serves a population of 46,626 and has an average d.w.f. of 2,327,000 gal. containing 53 per cent of industrial wastes, is designed to give full treatment to 3 times the d.w.f. and storm water treatment to any excess up to 5 times d.w.f. The trade wastes consist of wool scourings and textile wastes, salts of iron, dye waste and malting refuse. The plant consists of screens, grit tanks (96,000 gal.), preliminary settling tanks (1,008,500 gal.), fine screens, 4 aeration tanks (2,000,000 gal.) and final settling tanks of the Dortmund type (820,800 gal.). The amount of returned sludge is 8–10 per cent of the volume of incoming sewage. The excess storm water will pass into a storm water tank (340,000 gal.) and will be dosed on to an old percolating filter. The Agbrigg works has been de-

signed to treat a d.w.f. of 267,000 gal. from a population of 13,350. Three times the d.w.f. will be given full treatment. The sewage is of a strong domestic type and contains little trade waste. The plant consists of coarse screens, detritus tanks (33,500 gal.), fine screens, aeration tank (148,000 gal.) and settling tanks of the Dortmund type (80,000 gal.). The amount of returned sludge is 15–25 per cent of the volume of incoming sewage. The excess storm water is passed into a tank of 53,000 gal. capacity and dosed on to an old percolating filter.—L. Ives, *J. Inst. Mun. & County Eng.*, 54: 1577, 1928. (From papers of Water Pollution Research Board, England.)

Typhoid Fever and Its Occurrence in Honduras—In this article is reported an attempt to determine the source of typhoid fever which has occurred sporadically in Tegucigalpa and Comayaguela, Honduras, for the past few years.

Water for these municipalities is taken from a mountain stream which is impounded to provide storage. From here a pressure conduit supplies a reservoir close to the cities mentioned. Previous examination of the watershed disclosed possible contamination from flood washing of inhabited areas following heavy rains. An examination conducted by the health department this past year discounts this as a source of contamination, the dry, arid, vegetation-free surroundings insuring freedom from active contamination at this point.

The author expresses his conviction that lack of latrines and the excessive prevalence of flies close to town are the main causes of enteric infections in the cities. He stresses the necessity of: (1) Constructing fly tight latrines both in the cities and in the country, and (2) systematic destruction of flies.—Anon., *Bol. San. Honduras*, 7, 11: 1 (Aug.), 1928. Abstr. H. A. Johnson.

Experimental Studies of Bacterial Death Rates in Polluted Waters—In an attempt to understand better the processes of natural purification as observed in streams, the Stream Pollution Investigations Laboratory of the U. S. Public Health Service has devoted considerable study to comparing the bacterial changes which take place in waters under various laboratory conditions with the changes occurring in the stream. In these studies water collected from the Ohio River at Cincinnati was used. The bacterial changes occurring in the Ohio River between Cincinnati and Louisville have been determined.

The bacterial changes taking place with four experimental set-ups are given as follows: (1) Samples were stored in glass bottles in the incubator at temperatures of 10, 20 and 37° C.; (2) samples were held in wooden buckets at air temperatures, with intermittent agitation, and exposed to diffused daylight; (3) results are noted from samples stored suspended in the river at the site of collection; and (4) bacterial changes were followed in water pumped from the river and detoured through artificial channels constructed on the laboratory grounds.

Under the first three conditions the bacterial changes were not comparable with those observed in the stream. In the fourth set-up the changes observed simulate those in the natural stream.

The article is accompanied by tables of detailed analytical data and descriptive charts.—C. T. Butterfield, *J. Bact.*, 16, 4: 257–267 (Oct.), 1928. Abstr. C. T. Butterfield.

Attempts to Transmit Malaria Organisms Mechanically through Mosquito Biting—Noting the very short time required for the act of biting which produced natural infection from infected mosquitoes, the author made experiments to determine the possibility

of mechanical carriage of malaria by mosquitoes. Several species were used, one of aedes and one of anopheles. The mosquitoes were allowed to bite cases of malaria having numerous ringforms and moderate numbers of gametes in the blood, and then transferred to the non-infected subjects and allowed to engorge themselves completely. In this way the sexual phase of development in the mosquito was bridged over. In a series of twelve subjects exposed in this manner, no case of malaria occurred. Malaria organisms were found, however, in the mouthparts of mosquitoes examined immediately after biting a case of tertian malaria.—Bruce Mayne, *Indian J. M. Research,* 15, 4: 1067–1071 (Apr.), 1928. Abstr. W. H. W. Komp.

Liquor Effluents Research Committee—In a summary of the report by Dr. Parker, it is stated that the usual gas works practice of storing tar and liquor in the same well increases the effluent difficulty, since the ammoniacal liquor absorbs higher tar acids. Tar and liquor should be separated as soon as possible and stored separately. A tar extractor (designed by Woodall-Duckham) was installed at the Hinckley Gas Works, in the hot foul gas main of the retort house. This extractor reduced the quantity of higher tar acids in the mixture of the liquors condensed at various points, from the equivalent of approximately 240 parts of oxygen absorbed per 100,000 to 150 parts. Further improvements are anticipated. With regard to the oxygen content of the gas, it is clear that air for purification should be admitted at the inlet to the purifiers, after condensation and removal of liquor, if the quantities of thiocyanate and thiosulphate are to be kept at a minimum. The diminution in the temperature of the liquor in the tar and liquor well, consequent to the installation of the extractor, in addition to causing a smaller loss of ammonia, has resulted in less oxidation of the liquor. In consequence, a smaller removal of hydrocyanic acid in the Livesey washers and tower scrubbers has occurred and the amount of thiocyanate in the final liquor has fallen from an equivalent of 650 parts of oxygen absorbed per 100,000 to 410 parts and of thiosulphate from 160 to 80 parts. An improvement of 20 per cent in the oxygen absorbed value of the total effluent would be obtained if the " devil " liquor were treated separately by some such method as evaporation by spraying into the base of a hot chimney. Eighty-five per cent purification of effluent liquor can be obtained by biological filtration on two filters in series. Mixtures of spent liquor and bacterially purified effluent containing 8 per cent of the former should be used. Admixture of crude effluent with domestic sewage is permissible provided the flow is uniform. —2d Report, *Gas J.*, 182: 1016, 1928. (From papers of Water Pollution Research Board, England.)

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Some Aspects of Industrial Health Services—The author suggests a cooperative effort in which employer and employe may combine forces to mutual advantage, and points out a few health activities which establishments may undertake and which business executives have found to be profitable. The human machine is and will long remain the most vital and indispensable mechanism in the production of industrial wealth. The essential activities to be considered in organizing are: (a) medical services whose efforts are directed mainly toward disease prevention and health conservation, although curative measures should not be omitted, and general medical examinations, including those presumably well, should be stressed for a number of reasons (omitted by the abstractor); (b) first aid provisions conducted by thoroughly trained and experienced attendants, which have demonstrated their value in the marked reduction in the loss of time, and which are generally recognized as dividend paying investments of a high order; (c) a nursing service whose extent depends upon the policy relative to medical and surgical work, and the scope of outside agencies, the results of which may be measured in terms of lessened absenteeism and labor turnover, and increased loyalty, contentment, and efficiency; and (d) a dental service which has realized its importance in some 72 plants in the United States. (Names of some of these are given.)

In addition, an industrial health survey should be made of the plant with a detailed study of conditions which should be corrected. This will require no small degree of technical skill and business ability. The merits of industrial health work will depend to a large extent upon the objectives, and there are at least six principles which should be visioned: (1) It should be exactly as represented. (2) It should compose the spirit of service. (3) It should be developed as conditions warrant. (4) It should include preventive as well as curative measures. (5) It should take into consideration home and community conditions. (6) It should produce results which will fit the expenditures.

The costs of industrial health services will vary with a number of things, but will amount to from $6 to $12 per year per employe. Preventive dental work has ranged from $.47 per year to $3.03 per employe. These expenditures should be considered investments since they yield occasional dividends. One large concern in Canada reports a return of $1.26 on every $1 invested in its health program.

In summarizing the tangible returns from industrial health services, experience shows that returns can be measured in dollars and cents, in addition to any results which do not lend themselves to monetary calculations. An insurance company points out that periodic medical examinations have a potential life saving value of $30 each. The cost of labor turnover is estimated at $45 per person. Medical services should therefore be accredited with a minimum of $45 for each applicant examined who is found unfit for employment, and with a similar amount for applicants found fit for special employment only. Laboratory examinations should be con-

sidered worth the current local prices for same. First aid dressings and surgical operations have a tangible value according to local standards, while the installation of facilities in the plant effects a great time saving. The saving in infections and other serious complications may be conceivably placed at double the amount of operating expenditures. While the number of competent industrial health services is still relatively small, the tangible returns exceed the operating costs by a substantial majority.—Bernard L. Wyatt, Some Aspects of Industrial Health Services, Published by State Charities Aid Assn., New York, N. Y.

Recent Trends in Occupational Diseases in Ohio—Comparing reports of occupational diseases of the State Department of Health for the 2½-year period ending December 31, 1927, with the previous 5-year period ending June 30, 1925, the authors find that for the 15 compensable afflictions listed in the schedule of the Industrial Commission since 1921, the number of reports has increased rapidly from year to year; also reports of non-compensable occupational diseases have increased remarkably. The diagnosis of occupational diseases is made by any licensed practitioner of medicine, the employer is notified when the case is compensable and a hearing allowed in case of protest, while the State Department of Health and the Industrial Commission keep each other informed of all occupational disease reports received.

For the 2½-year period there was a total of 2,738 compensable cases, of which 2,400 were males and 338, females. The number of non-compensable cases reported was much smaller, consisting of 192 cases—170 males and 22 females. This makes a grand total of 2,930 reports. There were also approximately 182 cases reported which the authors could not classify as occupational diseases. Many of these were accidents, pure and simple, and some were diseases having no clear relation to occupation.

No cases of anthrax or glanders were reported during the period and these diseases have little importance in Ohio; in fact, no case of glanders has ever been reported in the records, which extend back to 1913. There were 450 cases of lead poisoning, the chief distributions being as follows: storage battery works, 121; painters, 106; automobile manufacturing, 39; brass and bronze products, 32; white lead plants, 28; the rest scattered through various occupations such as rubber workers, painters, pottery workers, enamellers, glass workers, chemical workers, etc. Two cases of mercury poisoning were reported, one in a metallurgist, and another in an art glass worker. No phosphorus poisoning was reported. Arsenic occurred in but 4 cases—a plate glass factory worker, a worker exposed to arsenureted hydrogen in a radiator factory, a sprayer of trees, and a milliner. There were 26 cases of benzol poisoning (including its derivatives). Eight cases from benzol occurred among sprayers in a novelty factory, 4 among rubber workers, 3 in dry cleaners, 1 in a shoe cementer, 1 in an oil station attendant, and 1 handling "Formica." Two para-toluidin poisonings occurred in dye makers. Nine cases of benzine and naphtha poisoning were reported in dry cleaners, pump testers, spray painters, and users of cleaning fluids. The 1 carbon bisulphide case occurred in rubber work. No wood alcohol poisoning was reported. Two cases of chronic mine gas poisoning are placed under carbon dioxide on the schedule. Brass and zinc poisoning furnished 11 and 17 cases respectively. Out of the total of 2,738 compensable cases, 2,210 were dermatoses, of which number 313 were in females (a long list of agents and exposures is given). The two largest

groups of dermatoses were 395 cases due to oils and cutting compounds, 608 cases associated with rubber manufacture, 104 due to lime and cement, and 149 due to acids and alkalies.

The 5 cases of epithelioma which were reported occurred upon the hands, cheeks, and lips from exposure to carbon, tar, and tarry compounds. But 1 case of compressed air illness occurred.

The non-compensable occupational diseases included a number of poisonings from carbon tetrachloride, cyanides, copper, "Duco," manganese, "rubber," and turpentine. Also a number of systemic diseases such as arthritis, asthma, bronchitis, pneumonia, tuberculosis, conjunctivitis, and diphtheria and scarlet fever (the two latter occurring in hospital employes). There were reported only 6 cases of silicosis and 6 of pneumonokoniosis, not including 261 reported by Kindel and Hayhurst in a special study of 919 sandstone quarrymen (this JOURNAL, August, 1927, pages 818–822).

The present yearly average of 1,172 reported cases is compared to the 645 average of the previous period, an increase of 81 per cent. Decreases were noted in but three limited groups—lead poisoning among automobile painters, benzol poisoning, and dermatitis among rubber workers. All others showed increases, some very great. The total increase in the compensable cases was 71 per cent, and in the non-compensable cases, 997 per cent. The authors have prepared tables presenting the relations to compensability, cause, industry, trade processes and sex, which are available for free distribution.

The increase in reported occupational diseases in Ohio is due, it is thought, not so much to an actual increase in the number of cases but to the increasing spread of information concerning them and the influence of the compensation law. Most of the more important afflictions have been investigated and means found to alleviate their effects, with a result that the afflictions are being reduced, particularly in severity. Oftentimes physicians have to be written to for additional information concerning the cases they have reported and occasionally the department finds it necessary to make a local investigation in order to satisfy itself. It is regretted that there is any arbitrary discrimination in the matter of compensating occupational diseases (as by the present schedule method), and would urge that all specific occupational diseases be made compensable in Ohio. Until that time comes experience will have to be built upon the faithfulness of physicians in reporting every non-compensable case, even though there is no opportunity for the medical fee to be derived from the state as in the case of the compensable cases.—Byron E. Neiswander and Emery R. Hayhurst, *Ohio State M. J.*, XXV, 1: 37–41 (Jan.), 1929.

The Summer Comfort Zone; Climate and Clothing—The present study describes an investigation in which the comfort zone for summer conditions was determined.

The studies were conducted in the psychrometric chamber at the Harvard School of Public Health. In all, 15 experiments were conducted, 8 of which were with progressively increasing room temperatures and 7 with decreasing room temperatures, in order to approach the comfort zone from the lower as well as the higher temperature condition.

The sensation of comfort was represented as before under 5 classes: cold, comfortably cold, very comfortable, comfortably warm, and too warm. In all there were 91 subjects, 56 males and 35 females.

All of the requisite observations of temperature, humidity and air motion were made and the effective temperatures were computed on the basis of

these observations. It was found from these studies that the probable lower limit of the comfort zone was at an effective temperature of 64° F., the probable optimum condition at 70.5° effective temperature, and the probable warm limit 79° effective temperature.

Comparing the optimum point for summer with that for winter conditions, the authors find a difference of 4.5° effective temperature.

The influence of room occupancy on the optimum temperature was accorded much study. Most of these experiments were conducted with 14 people in the test chamber, allowing a net floor area per occupant of 11.5 square feet. When the number of occupants was reduced to 8, no appreciable difference was found in the results. But when, on the other hand, the number of occupants exceeded 20, the comfort votes were noticeably affected. Under these conditions, there exists a difference of 1.4° in the probable optimum effective temperature. They conclude from these data that one might expect to find a lower optimum temperature in auditoriums and schoolrooms than in residences and offices. An effective temperature chart with superimposed comfort zones is presented.

In order to obtain further data on the subject of optimum temperature conditions, the authors conducted an inquiry into the type of underwear worn by Americans and Canadians. This information was obtained from 80 clothing stores located in 30 different cities. The conclusion is drawn that some wool and some light weight cottons are worn at all seasons of the year, no matter what the temperature may be. It is the belief of the authors that the difference in the optimum effective temperature between American and English persons is due, in some measure, to the difference in the clothing habits of the two peoples.

[This contribution is an exceedingly valuable one. For the first time, winter and summer comfort zones are plotted on the same scale and, to the best knowledge of the reviewer, air motion of from 15 to 25 feet per minute is credited with its proper place on the comfort chart.]—C. P. Yaglou and Philip Drinker, *J. Indust. Hyg.*, X, 10: 350 (Dec.), 1928. L. G.

Occupational Poisoning in the Manufacture of Luminous Watch Dials—The author in this detailed article appearing in two issues of the *Journal of the A. M. A.* expresses great surprise that a leading authority should claim radium poisoning in watch dial painters to be an obscure disease. The number of girls exposed in the New Jersey cases was about 800 between 1917 and 1924, but there were never more than 250 girls working at one time. Among these employes have occurred 15 known deaths in which the so-called radium poisoning is strongly suspected, and it was proved to be a cause of death in 5 cases. The author then discusses luminous painting; the chronological order of events in the New Jersey cases; the death from aplastic anemia of Sabin A. von Sochocky, the originator of the formula, November 14, 1928; the litigation which has occurred; the author's interpretation of the disease; special symptomatology; diagnosis during life; the methods for detection of radioactivity; the diagnosis after death which is essentially evidence of severe anemia, jaw necrosis, the radiation ostitis in other bones, secondary sepsis, the photographic findings of radioactivity, etc.; the prognosis and treatment; the future prophylaxis in the watch dial industry; and the matter of criminality in the New Jersey cases.—Harrison S. Martland, *J. A. M. A.*, 92, 6: 466–473; and 92, 7: 552–559 (Feb. 9 and 16), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Utilization of the Iron of Meats as Compared with Other Protein Foods—This paper is a progress report of an investigation of the utilization of the iron of protein foods for growth and other normal functions of albino rats, the especial purpose of which was the development of evidence as to the specific values of meats in comparison with other protein foods as a source of iron in human nutrition.

In a study of the specific effects of meats and other protein foods on the iron content of the growing albino rat, 74 rats were fed, in most cases individually, from the time of weaning, for periods usually of 5 weeks, after which iron was quantitatively determined in the entire body minus the alimentary tract.

Skimmed milk powder, whole milk powder, beef muscle, beef kidney, beef brain, beef liver, navy beans, hen's egg and peanuts were so included in diets that in each case a single protein food constituted the sole source of protein and iron. When skimmed milk or whole milk powder was used as the sole source of protein and iron, the growth was excellent, but during 5 weeks' feeding the iron content of the bodies of the rats was reduced to 50 per cent of the normal, and after 7 months' feeding on such diet, female rats were unable to rear their young. The growth from the egg diets was excellent; from the muscle, liver and kidney diets, fair; and from the brain, bean, and peanut diets, poor.

The iron content of the rats which received the meat foods was apparently normal in each case. The iron content of the rats fed on egg was much lower, and that of rats which received peanuts was lowest of all. Each of the seven protein foods studied, other than milk, was much superior to milk as a source of dietary iron for growing rats.—R. C. Miller, E. B. Forbes, and C. V. Smythe, *J. Nutrition*, 1: 217 (Jan.), 1929.

Salts in Milk and Their Importance in Dairy Work. I. The Acidity of Milk—This article emphasizes the importance of the milk salts in explaining the acidity and variations in acidity of milk. The individual salts, the amounts of which vary widely in milk, are important in explaining many phenomena in dairying and especially in dairy manufacturing. It is pointed out that the ash of milk contains the elements calcium, magnesium, sodium, potassium, iron, copper, chlorine, phosphorus, sulphur, oxygen, and carbon in various combinations, and that the salts formed should not be grouped and reported simply as "ash." Attention is directed to the fact that there is no lactic acid present in fresh cow's milk and that the acidity of such milk is due to monobasic phosphates, to dicalcium phosphate in the presence of other soluble calcium salts, to casein, carbon dioxide and citrates. The part which each one of these factors plays in producing acidity is discussed. Due to the wide variation in the salt composition of milk, there is necessarily a wide variation in the acidity. The average acidity of fresh milk is 0.14 to 0.15 per cent, the extremes found so far being 0.1 to 0.26 per cent. The composite milk from some herds has been found to have an acidity as high as 0.23 per cent. Since the acids present in such fresh

milk are much weaker than lactic acid, these high acid reactions are not objectionable.

In terms of pH such high acid fresh milk is shown to be of the same real acidity as a milk of a lower titratable acidity.

The author states that it is unjust to reject or condemn milk solely on the basis of an acid test, since some fresh milk of Grade A quality, containing less than 10,000 bacteria per c.c., may contain acid as high as 0.18 per cent. It has been found that acidity of fresh cow's milk is independent of the kind of feed given the animal, and is quite fixed and characteristic of any cow.—H. H. Sommer, *Milk Dealer*, Jan., 1929, p. 49.

Mussel Poisoning—Previously (*A. J. P. H.*, 17, 10: 1094 (Oct.), 1927) reference was made to an article reporting cases of mussel poisoning in California during July, 1927. The present article is a more extensive discussion of the cases, their symptoms, and the probable nature of the toxin. A group of 102 persons were involved in the 1927 outbreak in California. There were 6 deaths. The victims of the poisoning had eaten steamed, cooked, or raw mussels of one of the Pacific Coast varieties (*Mytilus californianus*), freshly gathered in different places which are located approximately 45 miles south and 50 miles north of the Golden Gate. The symptoms of the poisoning are primarily peripheral paralysis which may vary from a slight trembling and numbness about the lips to a complete loss of power in the muscles of the extremities and neck, and to death by respiratory failure. In a moderately severe case, the tingling, stinging sensation around the lips, gums and tongue would develop from 5 to 30 minutes after the consumption of the mussels. This was regularly followed by numbness or a prickly feeling in the finger tips and toes, and within 4 to 6 hours the same sensation would progress to the arms, legs, and neck so that voluntary movements, as for example raising of the head, were made only with great difficulty. In all cases of moderate severity this ataxic weakness and stiffness of locomotion was accompanied by a peculiar feeling of lightness. Incoherence of speech was noted in one of the fatal cases; vomiting was inconstant; diarrhea and abdominal pain were not recorded in the untreated cases.

Records of the carefully controlled cases showed the average temperature to be slightly subnormal (mean 98° F.). The pulse was firm and slightly accelerated.

The poisoned shellfish involved in the 1927 catastrophe originated from at least 14 different areas or beds on the open shore line of the Pacific Coast. Commercial mussels obtained from various places of the San Francisco Bay were not connected with any of the poisoning cases. In size, coloring, and consistency of the shells, the poisonous mussels differed in no way from those which were found to be non-toxic. No abnormal taste or odor was noted. In fact, many of the patients commented on the fact that the mussels tasted unusually good. When examined at the laboratory, every one of the staff who opened the fresh and living mussels noted a peculiar pungent, nauseating odor which was particularly marked in the highly poisonous mussels. It is justifiable to consider the irritating odors of toxic mussels resembling spoiled meat infusion as abnormal.

The digestive gland (liver) of the highly toxic mollusks was always enlarged, dark greenish, and friable. While data are incomplete on the distribution of the poison in the mussels, in two experiments the liver was considerably more toxic than the mantle tissue, but in two additional tests the [illegible] upon examination of mussels

lected along the entire Pacific Coast, it was found that in July the mussels at localities along the coast as far south as the Pacific Grove, and even along the Farallone Islands in the open Pacific, were toxic. Paralytic mussel poisoning has been observed in the months of May, June, July, August, September and October, but never during the winter months. This fact gives rise to the impression that this seasonal occurrence may in some way be associated with the spawning period of the mollusks. In studying the actual nature of the toxin present in the mussels, it was concluded that the mussel poisoning is not due to specific bacteria. Chemically, the toxin is apparently a quaternary (or possibly tertiary) amine. It is not identical with mytilotoxin described by Brieger.

It was shown that the objects on which mussels grow have no influence upon their toxicity. It was further shown that the toxin is not a decomposition product, and that decomposition of the mussels actually decreases the toxicity and finally destroys the poison entirely. No correlation was established between the toxicity of mussels taken from above or below the low water level. After considering the question of whether the toxicity of mussels is the result of an actual disease from which the mussels are suffering, it was concluded that mussel poisoning is not due to the direct action of the bacteria or to their toxins, but is the result of a promptly acting thermostable poison which has all the properties of a "sex poison." Continuous observations and more extensive chemical and physiological metabolism studies are required in order to solve the problem of mussel poisoning.—K. F. Meyer, H. Sommer, and P. Schoenholz, *J. Prev. Med.*, 2: 365 (Sept.), 1928.

The Vitamin B Content of Wheat Bread Baked with Varying Amounts of Yeast (Über den Vitamin-B-Gehalt von unter Zusatz verschieden grosser Hefemengen Gebackenen Weizenbroten) —The vitamin B content of wheat bread as usually baked is very slight. Vitamin B deficiency in pigeons which have been fed polished rice cannot be overcome by means of wheat flour, or ordinary wheat bread, nor can young growing rats be protected from vitamin B deficiency by feeding such bread. The authors state that a wheat bread weighing about 350 g. contains 280 g. of flour and 5 g. of fresh yeast, and they wished to find whether it was possible, through increasing the amount of yeast, to increase the vitamin content of the bread, especially to such a point that the bread might be designated as a source of vitamin B. Three types of bread containing, respectively, 5, 15 and 30 g. of yeast were used in feeding pigeons and young rats, which were on diets otherwise deficient in vitamin B. The pigeon experiments showed that with increasing amounts of yeast used in baking, the vitamin B content of bread can be increased so that the bread gains in protective power against vitamin B deficiency.

In young rats, bread containing 5 g. of yeast did not prevent avitaminosis. The use of 15 g. of yeast showed a somewhat better result, but with the use of bread baked with 30 g. of yeast, a growth, not at all the optimum but nevertheless satisfactory, was accomplished. It is concluded that by increasing the amount of ordinary yeast used in bread baking it is possible to increase the vitamin B content of the resulting bread, even when practically vitamin B free wheat flour is used. The amount of wheat used must be greater than ordinary, and must be at least between 15 and 30 g. Bread so made would not be wheat bread in the usual sense, but would become really a "yeast bread."—Arthur Scheunert, Martin Schieblich, *Biochem. Ztschr.*, 202, 8: 380 (Nov.), 1928.

A Poison Produced by B. Enteritidis and B. Aertrycke Which Is Active in Mice When Given by Mouth—This paper presents the results of experiments in which bacteria of the enteritidis and aertrycke types and their products were given by mouth to mice, which are susceptible to spontaneous infection by this route with these organisms. Seventeen strains of paratyphoid bacteria isolated from foods or rodents, or from persons infected during food poisoning outbreaks, produced fatal infection in 100 per cent of mice to which they were fed. These strains included 7 of *B. enteritidis*, 9 of *B. aertrycke*, and 1 of *B. Shottmülleri*. After studying the toxicity of living, boiled, autoclaved, and autolyzed washed cells, as well as whole unaltered, boiled, autoclaved, and filtered fluid cultures of 17 food-poisoning strains, it was concluded that apparently there is often something produced in broth, chopped meat, and beef heart cultures of *B. enteritidis* and *B. aertrycke* that is toxic for mice when given by mouth. When boiled broth cultures and Berkefeld *N* and *W* filtrates of broth cultures of these strains were fed similarly to mice, a mortality of approximately 40 per cent occurred.

When whole unfiltered cultures in beef heart medium are boiled or autoclaved, and then fed to mice, the mortality is often from 40 per cent to 100 per cent. Feeding autolyzed, boiled, or autoclaved suspensions of the washed bacteria had little, if any, effect. Filtrates of 24-hour cultures produced a higher mortality than those from cultures which were incubated for longer periods of time. There was no great difference in the pathological picture presented in the necropsy between mice receiving living cells and those receiving sterile materials derived from them. The greatest mortality among the mice fed living cells, and from which the organisms were recovered, was between the 4th and 9th days; whereas, among the mice fed with other materials and from which no paratyphoid bacteria could be isolated, it was between the 7th and 14th days.

The poison described in this paper is not injured by boiling, or by ordinary autoclaving. In its remarkable heat stability this poison resembles the other toxic materials which have been described in the paratyphoid group, but its surprisingly long incubation period seems to separate this toxic substance quite definitely from that responsible for the violent gastrointestinal symptoms occurring in man after eating foods containing these bacteria, and from any other toxic product of these bacteria that has yet been described. Further investigation will be necessary before it can be determined whether this toxic principle is a product of the bacterial cells or a chemical poison formed by the action of microörganisms on the constituents of the medium. The recovery of *B. aertrycke* from mice fed *B. enteritidis* and from mice fed autolysates of both *B. aertrycke* and *B. enteritidis* lends further support to the conclusion that rodents are sometimes carriers of the organisms causing food poisoning.—Sara E. Branham, Lucile Robey, and Lois A. Day, *J. Infect. Dis.*, 43, 507 (Dec.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

A Review of School Health Work—In this paper, Dr. Rogers speaks his mind frankly and fully on conditions and tendencies as he sees them. Speaking as from a tower of vantage, he tells us what he sees:

First, there is still lack of intensive training on the part of the school teacher who, after all, is really the one upon whom most reliance must be placed in promoting health habits. Also there is lack of appreciation of the need of getting the coöperation of parents. Our supply of money, too, is limited but it can be made to go further. The interdependence of mind and body is not yet realized.

It is evident that we are not yet in a position to apply adequate tests to determine the value of our health educational measures. But we should seize every opportunity to get what information we can through experiments with adequate controls. The author goes on to point out the absurdity of some of the contradictory things we teach under the guise of health education and the unjustifiable exactness with which some public health workers lay down the law. He quotes the delightful remark of Lord Kelvin to a student: "Your figures are far too exact to be accurate." School living conditions come in for a bit of criticism, and a quizzical glance is turned on open air schools and the ventilation problem.

In spite, however, of obvious defects and inconsistencies in our school health program, there is good reason, the author believes, for thinking that progress is constantly being made. He holds up to view the ideal that "Only a person possessed of high purpose begins to appreciate what health means."—James Frederick Rogers, M.D., Dr.P.H., A Review of School Health Work, *Trans., Fifth Annual Meeting, A. C. H. A.*, 1928.

Medical Service in a Continuation School—Is the medical supervision we give the school child as good as we think it is? Nobody knows, thinks Dr. Lewinski-Corwin, and he suggests that those in charge of a city's finances should have better proof of its value than "the say-so of goody-goody individuals or citizens' committees."

With such feelings in the background, the authors of this paper have taken part in a study in the continuation schools of New York City, having for its purpose "to study adolescent child life in relation to occupation and the formation of effective standards of guidance in occupational adjustments and physical fitness."

This continuation school work aims to give the pupils a thorough physical and psychological examination under the most favorable conditions. Both health and education departments are coöperating in the study. Adequate hospital contacts are made to insure prompt treatment of remediable defects.

As to the follow-up procedure, an effort is made to get both pupil and parent interested. It has been found that interest comes more readily in this class of pupil whose contacts with the world of work have given him some idea of the economic value of health. For 4 consecutive weeks the pupils are recalled for follow-up purposes. That failing, a personal letter goes to the parent. The next step, in case of fail-

ure, is a home visit by the teacher. It has been found that under this plan it has taken on an average about 3 months to get remediable defects corrected. And there is no guessing about this corrective work: a careful check-up is made.

The fact that so many children with remediable defects are to be found in the continuation schools casts serious reflection on the way health supervision is being carried on in the elementary schools.—E. H. Lewinski-Corwin, Ph.D., and Alice E. Paulsen, Ph.D., Medical Service in a Continuation School, *Trans. Fifth Annual Meeting, A. C. H. A.*

Raising Our Average of Corrections—Three-fourths of our school children have one or more physical defects needing correction. The question is, how can we raise the average of correction of these defects? The author assumes that three factors are involved: the discovery of the defect, convincing the parent of the need of its correction, and offering facilities for correction within the means of the parent.

To discover defects we must have physicians skilled in school work as well as in general medicine. It is not practicable to employ specialists. To get such school physicians, postgraduate courses should be offered to which the physician should be sent at the expense of the municipal authority responsible for school health supervision. Extra salary should be paid those who have taken such courses. The same should hold true for school nurses.

Right here Dr. Cornell offers the interesting suggestion that nine-tenths of existing defects can be discovered without removal of clothing other than coat and shoes. He further suggests two kinds of examination, one the simpler kind indicated above—required by law; and another more complete optional one.

After a word on the waste involved in having the nurse spend too much time on minor skin affections and the like; the sending home of unwarranted notices to parents; and the part that the school teacher can play in the detection of defects; the writer goes on to the persuasion of the parent and child. In his experience "it may be said that in the poor and ignorant element of the population, medical inspection without the service of a nurse is a failure." The teacher, he thinks, is an even more powerful agent, but is too busy to take the trouble. The child can be made to bring about the correction of his own defects if school competition is judiciously employed.

In speaking of the facilities ordinarily available for the correction of physical defects, the author points out present shortcomings and evidently would like to see more free service even where the social service worker might protest.

Interest is expressed in greater attention on the part of the family physician to the health of the children of his clientele.—Walter S. Cornell, M.D., How Can We Improve Our Procedure for Correction of Physical Defects, *Trans., Fifth Annual Meeting, A. C. H. A.*

Correction of Defects—Discussing the correction of physical defects in school children, Miss Chayer believes that "one of the prerequisites for a program of correction of defects is a leisurely, attitude-forming health examination," one with the child's parents present. Such an examination probably would be given only once in two or three years. Then, too, it is essential that the medical examiner be a person of conservative judgment, especially in the matter of tonsil removal. An early start on the program is important—in the kindergarten rather than in the high school. Preschool work is more important still.

Lastly, there must be a constant checking up on results, and measures

should be discarded—no matter how well established—if they do not produce results. In Miss Chayer's city they discouraged the use of milk at school except on the part of children who were failing to gain, despite the excited protests of the milk dealers as well as of certain parent-teacher association members. (One can imagine that this took courage.)

Miss Chayer believes the classroom teacher holds the key to the correction program because she "knows how to create those attitude-forming situations which make for the success of our efforts."—Mary Ella Chayer, R.N., Discussion of a paper on the Correction of Defects, *Trans., Fifth Annual Meeting, A. C. H. A.*

The Child with Potential Heart Disease—Dr. Kerley's article touches tremendously important and at present much neglected points in diagnosis and treatment of potential heart conditions in children under 12 years of age.

No progress in alleviation or cure of organic, acquired heart disease has been made in the last 40 years, in Dr. Kerley's opinion, though he does not discredit the efforts made to improve conditions for the child with heart disease.

The importance of early history is very great; "it was rare that the early history was not sufficiently suggestive to stamp the case as potentially cardiac" in the great number of cardiac patients that Dr. Kerley has handled. Warning signals are muscle pain and stiffness, sometimes joint pains, pains in extremities day or night. Restless sleep and the complaint of tired legs are also significant. Children who complain of muscle and joint pains, especially on wet or damp days, are potential heart cases. In such cases immediate removal of the tonsils regardless of appearance is demanded. The small buried diseased tonsil may be a serious focus of infection.

The question arises—does heart action show impairment? Irregular or rapid heart action disturbs parents and many physicians; also the presence of an apparently pathological murmur. A point to remember in this connection is that the pulmonic second sound in children is almost always louder than the aortic. Such conditions are often diagnosed as heart disease or potential heart disease but are not heart disease in any pathological sense.

Dr. Kerley describes a type of child especially susceptible to the infecting agencies that cause heart disease, and states that such a child "possesses what is termed a favorable soil and may be recognized and belongs to one of three groups:

Group 1. Those who have or who have had rheumatic fever.

Group 2. Those who have or who have had chorea.

Group 3. Those who complain repeatedly of pain in the extremities which may not be accounted for by trauma or disease."

A particularly susceptible child may be classified as belonging to the three groups. Heart disease in children so afflicted may be prevented in many cases by the eradication of disease foci; and by the use—at first persistent and later interrupted—of salicylic acid alone or combined with an alkali.—C. G. Kerley, M.D., *J. A. M. A.*, Feb. 16, 1929.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

National Conference of Social Work—The program for the fifty-sixth meeting of the National Conference of Social Work, June 26–July 3, and the 32 kindred groups meeting at the same time in San Francisco, will be particularly colorful this year since emphasis is to be placed on the latest developments in social work in the states where the Mexican, Chinese, Japanese and Indian groups form distinctive social problems.

The results of recent crime surveys are to be presented before the conference. Dr. George Kirchwey of New York, former warden of Sing Sing prison, is to be the chairman.—*Red Cross Courier,* 8, 5: 5 (Mar. 1), 1929.

Two Scholarships for Women in Health Education Field—Two full tuition scholarships are available for women in the field of health education at the Massachusetts Institute of Technology (Department of Biology and Public Health) for 1929–1930. These scholarships cover the full scholastic year, beginning in September and closing in June.

One, and perhaps both, will be awarded to candidates recommended by the National Tuberculosis Association. The right, however, is reserved to give one to another candidate if an application is received from one whose need and qualifications seem to be distinctly greater than that of any candidate applying through the National Tuberculosis Association.

The awards will be based upon the nature and quality of the previous academic work of the applicant, the ability which she has already shown in professional work in the field of public health or education, her need of scholarship aid and the probable value of her further contribution to health education.

Through an affiliation between the Massachusetts Institute of Technology and the undergraduate School of Education of Harvard University, those who wish to take courses in education while studying at the institute may do so without additional fee at either Boston or Harvard University.

The scholarships will be awarded June 25, 1929, and applications should be received not later than June 1. All those who are interested in these scholarships are invited to write to the Child Health Education Service of the National Tuberculosis Association, 370 Seventh Avenue, New York, N. Y., for application blanks.—*Health News,* 6, 9 (Mar. 4), 1929.

Posture, Health, and Efficiency—The complexity of civilization causes lack of adaptability between man's daily life and his physical and nervous make-up. Life has been intensified by the invention of the telephone, radio, automobile and aeroplane. These have enriched our lives, but have added strain which will bring physical and nervous disaster unless precautions are taken when the individual is very young. During childhood there should be no encroachment on the nervous and physical reserves of the individual. Great emphasis must be placed on the dangers of fatigue, and more thought given to methods of keeping fit.

Good posture and avoidance of fatigue are among the most fundamental requirements of general efficiency. The importance of this in adults and older children has been pointed out, but little

attention has been paid to posture of children between 3 and 12 years of age. The best place for research concerning the standards of posture for young children is the nursery school.

Figures obtained from adults show 3 hereditary body types: short and stocky, long and lanky, and average. Either extreme finds the establishment of good posture more difficult than those of average build. As yet it has not been determined which type in the course of growth is naturally helped properly, or in what degree apparently bad bodily mechanics are pathological, or in what degree they are merely the result of temporarily disproportionate growth of one part or another. To show this, records should be made of the posture of children at intervals of 6 to 12 months.

Records should be accurately kept which will show the following: height, weight, illness recorded to show effect on development, hours and type of play, amount of rest and sleep.

Postural records should include lateral and anteroposterior photographs of the nude body both sitting and standing in the positions assumed unconsciously, and in those which the child has been trained to take. These should be taken every few months to indicate the results of posture training. The natural trend of a young child under ideal conditions is toward good posture. Consequently, it must be determined what conditions are ideal for each stage of growth, and provide these conditions as nearly as possible.

After determining the standards, the problem of suitable posture training, if desirable, will not be simple. All elements of well-being, both mental and physical, must be constantly kept in mind. Play designed to develop a balance between the muscles will lead to natural assumption of good posture. Undue weakness of muscles in relation to the rest of the body should be studied and the cause determined. Some cure for the cause must be found.

Adaptation of a child's environment to his comfort and needs facilitates training in posture. Chairs and desks can be adjusted to the individual. Beds, pillows, and mattresses should be so arranged that it is difficult to fall into undesirable positions.

The benefit of many months of training can be lost in a brief period of convalescence. Attention to fatigue is essential in hastening recovery. While the patient is in bed, his position should be changed frequently. When he begins to move around again, activity should be resumed gradually.

Poor posture may lead to many ills. The " business man's stoop " and the " debutante slouch " cause many to become old in their youth. The mental growth of most individuals is retarded by the fatigue and strain which accompany poor posture.

On the other hand, an individual who is well set up is almost without exception radiantly healthy, unsusceptible to disease, and mentally efficient. Postural training may be therapeutic as well as prophylactic. Nothing fundamental, however, can be accomplished until fatigue, the great American ailment, is eliminated.

Success in correcting a majority of the postural faults in adults will help in teaching correct posture to children, because they learn so much by imitation. The setting of a good example will facilitate the educational problem. Better posture is one factor which will aid in obtaining success in life.—Fritz B. Talbot, M.D., Posture and Efficiency, *Pub. Health Nurse,* 21, 1: 8 (Jan.), 1929.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Something for Visitors to Do—The Germans know that exposition and museum visitors like to do more than pass along an aisle looking at displays. They have developed numerous devices by which a display is revealed through some act of the visitor. A lever is pulled, a button is pressed; the visitor puts his weight on a platform, or looks through an imitation telescope—and then lights flash, slides move, one scene gives way to another, or some other action follows.

Cafeteria Style Exhibits—Various devices could be worked out whereby some action on the part of a visitor will flash lights or move something or start some motion.

By stepping on a platform an electrical contact may be made which will flash lights—or start an automatic stereopticon—or start an electric train.

Or a push button may do something of the sort.

Or it may be done by gripping two short levers—controlled by heavy weights—and when the two levers are brought into contact the electrical connection is made.

Thus also a homemade hand grip may be made—possibly companion grips to be used by right and left hands at the same time.

Something may be made to move by the power of sand from a hopper—the hopper to be behind the scene—the sand, running down, goes into a bucket—by turning a handle at front of booth the bucket can be raised and sand dumped into the hopper to repeat the process—the bucket then to be weighted so that it will return to receive the sand again.

The same result might be secured by a series of small buckets carried around by a belt—in both cases the visitor will see only the wheel and some of the shaft or axle running back to the screen.

It may be that a small group of levers—in the fashion of a railroad switch tower—could be used to elevate in turn a group of pictures or illustrated diagrams—or the same device could be applied to the bars of an upright or horizontal diagram—each bar to be brought into sight by pulling a certain lever.

And so on.

(The basic mechanism for some of the above might be worked out even before the subject matter has been selected.)

A Contest Idea—One of your newspapers may be interested: In parallel columns, list a group of questions and the answers, but do *not* place the right answers opposite the right questions. The problem is to match the questions with the correct answers.

Questions	Answers
1—.....	A—(Answer to No. 2)
2—.....	B—(Answer to No. 4)
3—.....	C—(Answer to No. 3)
4—.....	D—(Answer to No. 1)

The questions may concern any given disease or health problem, or the work of the health agency. A newspaper might be interested in a series of such question lists, some simple awards to be given on the basis of both accuracy and

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

neatness—the second quality to extend the range of competition beyond merely getting in the first correct set of answers. You may consider the desirability of adding to every list a question like: "Where would you write, telephone or call for further information?"

The reader may be instructed to run oblique lines from the questions to the right answers, or you may tell him to list them: No. 1—D, No. 2—A, No. 3—C, No. 4—B, etc.

Exhibit Ideas from Books and Other Sources—Many ideas to adapt to exhibit or display use may be found in books on handicraft or home amusements.

Toy stores will suggest forms which may be made over and be used to express a health idea or fact.

Window displays will include devices which may be copied or adapted.

A Medical Information Bureau—The recent and phenomenal progress of modern medicine, and particularly of preventive medicine, necessitates the development of a direct and intimate channel of communication between the practitioner and the community. This is essential, not only that the public may learn to take advantage of the constant advances of modern medicine, but to the end that it may be protected against the hordes of charlatans, quacks and misguided zealots who, strange to say, thrive more than ever in this day of presumptive enlightenment. In appreciation of the needs of our day and society, the New York Academy of Medicine and the Medical Society of the County of New York have established a joint Medical Information Bureau. The aims of this bureau are to facilitate the dissemination of authentic information on medical and public health matters, to stem and curtail quackery and to promote a better understanding between the public and organized medicine.

—From a folder describing the Medical Information Bureau of the New York Academy of Medicine and the Medical Society of the County of New York. For a copy, address Iago Galdston, 2 East 103d St., New York, N. Y.

Congratulations! Now It Can Be Read!—Entering upon its eighth year the *Weekly Bulletin* (Calif. Dept. of Public Health) appears

. . . in a larger form, enabling the use of a larger size of type and permitting the use of graphic illustrations whenever an occasion may demand. The California State Department of Health began this weekly publication in February, 1922. The New York State Department of Health began publishing its weekly *Health News* two years later in January, 1924. The Ohio *Health News*, published bi-monthly, began in 1925. The Illinois *Health Messenger*, a bi-monthly, was started at the beginning of the present year. All of these publications superseded monthly journals, because the interval of thirty days between issues prevented the rapid dissemination of useful information relative to the prevalence of communicable diseases and their control. The New Mexico and Iowa state health departments now issue mimeographed weekly bulletins. Time has demonstrated the value of the weekly publication and public health workers throughout the state have emphatically stated their preference for it.

—*Weekly Bulletin.*

To New York is due credit for establishing the size and style of the printed weekly bulletins. To the list of mimeographed bulletins should be added that of Connecticut which supplements, or is supplemented by, a monthly printed bulletin.

Social Work Publicity Council—That is the new name of the Committee on Publicity Methods in Social Work, adopted by a big majority in a mail note. Nothing else is changed. The *News Bulletin* continues as the only publication devoted solely to publicity methods. The next series of meetings and exhibits will be held at San Francisco, Calif., June 26–July 3.

MOTION PICTURES

If your amateur movie friend wishes to go a step further and help you in producing a "talkie" for neighborhood production he will wish to study three methods for phonograph synchroniza-

tion described in *Movie Makers*, 105 West 40th St., New York, N. Y., Mar., 1929. *25 cents.*

The production of "Many Happy Returns" is announced by Universal Cinema Company, Indianapolis, Ind.—"a human-interest story on the importance of periodic health examinations." Did any recognized health worker supervise production of this picture?

"The Garden of Childhood"

. . . is a one-reel film which condenses into 12 minutes the important events in a well-cared-for child's day. The title suggests the analogy between the loving care a wise mother gives her child and the intelligent efforts of the successful gardener. The three children of the Rogers family eat the wholesome food that is placed before them, and are given the advantage of wise guidance in nursery school and kindergarten. They live a well ordered routine of rest, play and sleep. On the day of the story the children are taken to the physician for their health examination. One is immunized against diphtheria, another vaccinated against smallpox. Mrs. Rogers goes to a class where a nurse tells how to protect against communicable diseases, how to plan the child's diet, and how to make suitable clothes. The day ends with a bath, a quiet period, and early bedtime "to sleep the clock around." The picture has no so-called dramatic plot; the children live their story simply and naturally. The film should be a useful conclusion to any talk on various phases of preschool child hygiene. It is intended solely for that purpose.

—Free from the John Hancock Mutual Life Insurance Company, Boston, Mass.

EDUCATIONAL MATERIAL

Raymond S. Patterson may well be proud of "That Mean Cold," an 8-page booklet, his first production as director of health education for the John Hancock Mutual Life Insurance Company, Boston, Mass. *Free.* Page size, type size, double page headings, text, practical suggestions, and other detail go to make up a booklet many will actually read. Personally, I am not convinced that the tint block under the initial letters is good. Be sure to ask for samples.

A pre-view of *Three Portraits*, a John Hancock booklet for the early Diagnosis Campaign in April, shows promise of an equally readable publication. Get on the mailing list for copies when it comes out.

"Ten Commandments for Keeping Baby Well," Department of Health, New York, N. Y. Effective use of bold face type for the "commandments," with explanatory comment simply written. *Free.* On the cover page: "If the baby is sick and you cannot afford to pay a physician, *notify* Department of Health" (followed by list of various borough offices). The italicized word marks the one doubtful point in the booklet. Will the mother who "cannot afford" a physician readily know *how* to "notify" the department?

"Cheese in the home," "Peas in the diet," and "Cranberries in the diet," issued by College of Agriculture, Madison, Wis., are noteworthy for the excellent statements of "Why use . . ." appearing on the several inside cover pages. "Milk—the Best Food" carries a "Digest" (which should have a livelier title) which combines an outline of the subject matter with a table of contents—an idea some may care to adopt. *5 cents* each.

"The Baby and You," a 40-page pamphlet, Massachusetts Department of Public Health, is one of the best of the kind—in text, illustrations, and paper. Good introductory statement following the cover page. *It has a table of contents.*

The Tennessee Tuberculosis Association, Chamber of Commerce, Nashville, has reprinted in leaflet form the *Saturday Evening Post* editorial on "Buying Health." Striking title page—but the shiny paper seems unnecessary. *2 cents.*

A 4-page folder on "How to Conduct an Isolation Period in the Home" is being used by Newark, N. J., Winston-Salem, N. C., and Hamilton, Ont.,

Health Departments. *Free,* of City Health Department, Baltimore, Md. A more interesting paper might be used for this folder—an antique or a slightly rough surfaced paper, for example.

"Safeguarding Your Health from Tuberculosis," a 28-page booklet by Department of Health, Winston-Salem, N. C., with credit to New Haven, Conn., Department of Health for "much of the material." An effective, popular description, with a page to each of the following and other topics: "The Roll of the Private Practitioner," "Importance of Sputum Examination," etc. Includes diagram showing coöperation of public and private agencies. *Free.*

A 4-page folder on vitamins is being prepared by Bureau of Chemistry and Food, City Health Department, Baltimore, Md.

"Headaches: Do You Have Them?"—11 by 16 inch poster, mostly words. Good text. Employers' Mutual Liability Insurance Company, Wausau, Wis. *Free.*

These three booklets of the Metropolitan Life Insurance Company are diverse examples of well printed health education material:

"Just a Cold? Or—" 8 pages. *Free.*

"Sunlight the Health Giver," 10 pages. *Free.*

"Headaches," 8 pages. *Free.*

DATES AHEAD

April 21–27—Better Homes Week. "Guidebook for Better Homes Campaigns," Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C. *10 cents.* Includes campaign ideas available for other uses.

May Day—Child Health Day. Address American Child Health Assn., 370 Seventh Ave., New York, N. Y., for organizer in your state, and publications.

For May Day and other days—summer or winter: "*Play Day*—The Spirit of Sport," by Ethel Perrin and Grace Turner. American Child Health Assn., 370 Seventh Ave., New York, N. Y. 77 pages. *Many illustrations.* "A team for everyone and everyone on a team." *35 cents.*

TITLES AND PHRASES

"Every child well bred, well fed, wisely led"—Indiana State Board of Health.

"A goggle that is hanging on a nail is no better than a glass eye"—Employers' Mutual Insurance Liability Company.

"Grappling Versus Nibbling"—*Mental Hyg. Bull.,* 370 Seventh Ave., New York, N. Y.

"If your child contracts diphtheria, what excuse can you give?"—Detroit Dept. of Health.

"Make the common cold uncommon"—Indiana State Board of Health.

"Why die so Young?"—A Red Cross Nutrition Service talk.

DIPHTHERIA

How immunization of practically 100 per cent of the children in two towns of 6,000 combined population was made possible is told in *Prevention,* New Brunswick Dept. of Health, Fredericton. Jan.–Feb., 1929.

Immunization success by means of a motion picture and a lecture, with Parent-Teacher Assn. coöperation, in a community of 1,500 is described in *Ill. Health Messenger,* State Dept. of Health. Feb. 15, 1929.

"What Is Being Done about Diphtheria?" a WEAF radio talk, by D. B. Armstrong, M.D. State Charities Aid Assn., 105 East 22d St., New York, N. Y. *2 cents.*

"Your Child Looks to You for Protection," a 4-page folder, is one to secure when planning diphtheria printed matter. A little too much red ink, the editor believes. City Health Dept., Baltimore, Md. *Free.*

REPORTING

Annual reports can be roughly classified as surveys or obituaries. The first kind not only tells what has been accomplished and how, but compares results so that those things which are lacking or poorly done are emphasized sharply by contrast. Such a report stimulates to greater and better work in the future. The second kind recites in a eulogistic but monotonous way the deeds of the past, and serves merely as a record, which is consulted only if the occasion demands. In one sense an annual report should be like the record of a periodic health examination—designed to show up defects and to point out methods of prevention and cure.

The editor then shows that the current report of the Board of Health, White Plains, N. Y., belongs in the first class. —*Health News*, New York State Dept. of Health, Nov. 19, 1928.

"Vital Statistics of the Bellevue-Yorkville District" is significant as an illustration of possibilities in the assembly of statistical data as a basis for building a health program. The publication method illustrates the comparatively inexpensive reproduction of numerous detailed tables, together with maps and diagrams. The material was first typewritten (charts and maps drafted) and the whole reproduced by zincograph process on 49 pages, reduced to 10¾ by 8¼ inches, with a printed stiff board cover. First edition of 260 copies cost $187.50; 250 reprints costing $119.50. Copies were sent to the Bellevue-Yorkville Community Health Council, principals of public and parochial schools, state health officers, health officers of 30 largest cities, and health officials in several other countries. Copies will be supplied to JOURNAL readers upon request to Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y. G. J. Drolet, New York Tuberculosis and Health Association, supervised the report.

"Broadcast from Station 'Girl Scout' with Television Pictures," is the 1928 annual report of the National Girl Scouts, 670 Lexington Ave., New York, N. Y. *Copy free.* Of much interest to those who need not present a mass of detailed statistics in a report.

"The Hospital without Walls," a miniature report of Community Health Association, 502 Park Sq. Bldg., Boston, Mass. Beautifully done. Note use of two kinds of paper. *Copy free.*

"The Service of Print to May Day, 1928" is a 30-page pamphlet reporting the coöperation of periodicals, with classified lists showing what was done by the individual editors.

"Twenty-Five Years of Fighting Tuberculosis in Minneapolis and Hennepin County" is notable for its good cover page, including effective use of an outline map of the county and a border in silver on grey paper. There is a chronological record and also treatment by topics, with an abundance of pictures to toll the reader through the pages There is a table of contents, but it is called an index and is placed at the back—better to have been right after the title page. *50 cents.*

Unfortunately the 1927 report of New York Nursery and Child's Hospital, New York, N. Y., is out of print (copy will be *loaned* by the editor for 5 cents postage). Exceptionally pleasing example of a report covering considerable detail. Here are the specifications: 70 lb. India laid Utopian paper; cover of 65 lb. green Neapolitan; cover, title page and chapter headings in Narciss; the text in Caslon 8, 10 and 11 point. Photographs with one exception were taken by Paul Parker. Tipping in the photographs was fairly expensive, but is effective and necessary because of the interesting rough finish paper.

REQUESTS

"Can you refer me to any organization from which I might obtain height and weight charts, posture and health posters?" (For use in a large city public school.) What do you suggest?

BOOKS AND REPORTS

USEFUL BOOKS OF THE PAST YEAR

M. P. RAVENEL, M. D.

DURING the year which has passed since our last annual review, many books on hygiene and public health have been published. In fact, there appears to have been a veritable *cacoëthes scribendi.* Very few of those which directly concern health are outstanding. Many of them are along the old cut and dried lines, with nothing original in either fact or presentation, and many more are distinctly poor. We cannot but believe that the publishers are largely responsible for this deluge of poor books, some of which contain the most evident inaccuracies as to facts. Apparently any man who has large classes can have a book accepted since he can influence sales. We believe that it is time for the publishers to clean house, as it were, by exercising more care in the selection of manuscripts. As Elliot Holt has recently said in speaking of non-professional books: "Wouldn't it be more logical if publishers confined their efforts to fewer titles, each one commanding their most loyal backing and honest respect? Might not this method be better for the chosen authors themselves than being included in the deluge of publications from most firms that bewilders the public? "

In contrast to the mediocre quality of books written directly on the subject of health, we see a comparatively large number of unusually good ones on allied subjects. The growth of books on sociological subjects and mental hygiene is notable.

In the preparation of this review, the advice of others engaged in several fields of public health work has been obtained. While most of the books selected have been reviewed in our own JOURNAL, other publications, mostly American, have been examined, though British journals have also been used. In only one or two instances have new editions been mentioned, exceptions having been made in cases where the revision resulted in practically a new book, particularly outstanding in its class.

As before, we have attempted to classify the books recommended. In many instances, this has been extremely difficult, and such books have been placed in a general group. The classification given is not exact, and some will doubtless disagree with the grouping.

Technical bacteriology is represented by the following: *Newer Knowledge of Bacteriology and Immunology,* by Jordan and Falk, University of Chicago Press; *Bacterial Vaccines and their Position in Therapeutics,* by Leonard S. Dudgeon, Hoeber; *Filterable Viruses,* edited by Rivers; *Annals of the Pickett-Thompson Research Laboratory,* Volumes III and IV, Part I; and *Physiology and Biochemistry of Bacteria,* Volume I, by Buchanan and Fulmer; the three last published by Williams and Wilkins.

Since bacteriology has come to be required as a subject for general education, and is widely concerned in various manufactures and in household affairs, a general course is being given in many colleges and schools. Two excellent books designed for this purpose are: *A*

Text-Book of Bacteriology and Its Applications, by C. M. Hilliard, Ginn; and *An Elementary Text Book of General Microbology*, by Ward Giltner, Blakiston.

Closely allied with bacteriology are the courses in hygiene widely given under various names. In this class two especially good books have appeared: *A College Textbook of Hygiene*, by Smiley and Gould, Macmillan; and *Health Essentials*, by Andress, Aldinger and Goldberger, Ginn. The latter is based on the idea that many pupils do not go to college, and must receive their training in the more elementary schools.

The study of nutrition and of foodstuffs continues to occupy the attention of specialists, and their results are eagerly looked for by all interested in public health. For general reading, we can recommend: *Nutrition*, by W. H. Eddy, Williams and Wilkins; and *Food, Health and Vitamins*, by Plimmer and Plimmer, Longmans, Green. Somewhat more technical, but also adapted to non-professional readers, is *Food Infections and Food Intoxications*, by Samuel R. Damon, Williams and Wilkins. Since no single food is of more importance than milk, and so much depends upon its proper production and handling, good books on dairy science are always welcome. Among these: *Fundamentals of Dairy Science*, by Associates of Lore A. Rogers, Chemical Catalog Company; and *Dairy Bacteriology*, by B. W. Hammer, Wiley, are to be especially recommended.

The year has brought few new books on water and sewage disposal, but those which have appeared are well above the average. We can recommend: *Water Purification* (2d ed.), by Joseph W. Ellms, McGraw-Hill; *Chemistry of Water and Sewage Treatment*, by Arthur M. Buswell, Chemical Catalog Company; and *Principles and Practice of the Dilution Method of Sewage Disposal*, by W. E. Adeney, Macmillan.

The health officer is very directly concerned in administrative problems which often involve legal questions. These are well considered in *Dunn's Food and Drug Laws, Federal and State (Annotated)*, by Charles Wesley Dunn (3 vols.), U. S. Corporation; and *The Validity of the Appraisal Form as a Measure of Administrative Health Practice*, by Philip S. Platt, American Public Health Association.

In view of the great importance of health to the vast number of those gainfully employed, as well as to their employers, the lack of books on industrial disease is striking. *Prescribing Occupational Therapy*, by William Rush Dunton, Jr., Charles C. Thomas, though small, is an excellent guide. From the house of Harper come two good books: *Psychology for Executives. A Study of Human Nature in Industry*, by Elliott Dunlap Smith; and *Safety and Production*, a report by the American Engineering Council. The first is unusual, not only in its point of view, but in the admirable way in which the subject is handled. The second is devoted entirely to the prevention of accidents and does not consider health as a factor in safety.

History and biography are well represented by: *A Short History of Medicine*, by Charles Singer, Oxford University Press; *Folk Lore of the Teeth*, by Leo Kanner, Macmillan; *Max von Pettenkofer, His Theory of the Etiology of Cholera, Typhoid Fever and Other Intestinal Diseases*, by Edgar Erskine Hume, Hoeber; *Percival's Medical Ethics*, edited by Chauncey D. Leake, Williams and Wilkins; and *Fighters of Fate*, by J. Arthur Myers, Williams and Wilkins.

Mental Hygiene is too little considered and too little understood by the average practitioner and health officer. It is a specialty requiring particular training. In the past we believe that the specialists in this line have been too

aloof, but there are now books on the subject written in a style and on a level which the average man can understand and appreciate. Among these the following are recommended: *Why Men Fail,* edited by Fishbein and White, Century; *The Mental Health of the Child,* by Douglas A. Thom, Harvard University Press; *The Child in America, Behavior Problems and Programs,* by Thomas and Thomas, Knopf; *Psychology of Abnormal People,* by John J. B. Morgan, Longmans, Green; *The Problem Child at Home,* by Mary B. Sayles, Commonwealth Fund; *The Unconscious* —a symposium with introduction, by E. S. Dummer, Knopf; and *Understanding Human Nature,* by Alfred Adler, George Allen and Unwin, London.

Some unusually good books have appeared on special problems, all of which, however, touch preventive medicine and public health closely. Among these we can recommend: *The Opium Problem,* by Terry and Pellens, Committee on Drug Addictions, New York; *Cancer: A Professional Responsibility and a Public Liability,* by Albert Soiland, Appleton; *Principles of Ante-Natal and Post-Natal Child Hygiene,* by W. M. Feldman, John Bale, Sons and Danielsson; *Negro Problems in Cities,* by T. J. Woofter, Jr., Doubleday, Doran; *Chemistry in Medicine,* edited by J. O. Stieglitz, The Chemical Foundation; and *Nurses, Patients and Pocketbooks,* by May Ayres Burgess, Committee on the Grading of Nursing Schools, New York. The last mentioned of these books is a study of the nursing problem made in a conscientious and thoroughgoing style. It is of interest, not only to nurses themselves as a professional body, but to hospitals, practitioners and those who employ nurses. The book on the opium problem is the result of many years of study which embraced practically the entire world, and gives the most complete information available on the subject of narcotics, especially opium. Its value will be evident when we remember the International Congresses held to consider the question, and the vast amount of legislation passed without expert knowledge of the subject.

Our last group is those books which touch public health from several angles, some of which might have been included under previous heads or special heads: *Publicity for Social Work,* by Routzahn and Routzahn, Russell Sage Foundation; *Social Work and the Training of Social Workers,* by Sydnor H. Walker, University of North Carolina Press; *Growing Up. The Story of How We Become Alive, Are Born and Grow Up,* by Karl de Schweinitz, Macmillan; *Infancy and Human Growth,* by A. L. Gesell, Macmillan; *A Text-Book of Infectious Diseases* (3d ed. of *Goodall and Washbourn's Manual of Infectious Diseases*), by E. W. Goodall, Wood; and *The Genesis of Epidemics and the Natural History of Disease,* by Clifford A. Gill, Wood. The book on infectious diseases has been included because of its unusual character which makes it of especial value to health officers.

(*See p. XXXIII for announcement of new books*)

Epidemiology Old and New—*By Sir William Hamer, M.A., M.D., F.R.C.P. New York: Macmillan,* 1929. 180 pp. Price, $3.50.

One seldom comes across a book more provocative of thought. Anything written by the distinguished author is worthy of attention.

We are carried back to Sydenham and his "epidemic constitutions," which are considered and explained at some length. Influenza is taken as the great example of his thesis. Descriptions of the epidemics in the time of Sydenham as well as those of later years are given and compared. We are urged to break

away from the domination of bacteriological methods and to consider epidemic diseases as epiphenomena, as the outcome of the interaction between a virus and the humors of the body.

The author does not belittle the tremendous increase in knowledge due to the opening up of the new world of microscopic and even ultra-microscopic life, but holds that the macroscopic must not be lost sight of.

The book does not lend itself readily to review, containing, as it does, numerous quotations of, and references to, English writers and scientists chiefly, and many figures. While Sydenham has always been before us as one of the geniuses of medicine, the presentation and discussion of his ideas given by the author will create in the reader a still greater respect for him—in spite of some of his more or less metaphysical ideas —especially in this day when we have gone so far toward materialism in medicine. While Sydenham had ideas which modern knowledge prevents us from accepting, he was, as far as the practice of medicine went, an exponent of " that solid experience which rests upon the basis of the senses."

The book is well printed on light paper, and can be commended to all who seriously study epidemiology and the science of medicine. M. P. RAVENEL

The Health of Youth—*By Florence Meredith, M.D. Philadelphia: Blakiston,* 1928. 535 pp. Price, $1.60.

This is a work designed for use as a textbook on hygiene during the adolescent period. It seems more suitable for senior high school grades.

It is in attractive, readable form and places emphasis on health and right living, rather than on anatomy or disease. It has at the end of each chapter a summary stated as separate facts, each of which might well be used as a topic for discussion. The chapters, 22 in number, cover such health topics as: Food and Diet, the Hygiene of Eating, Fresh Air and Ventilation, Exercise, Fatigue, Bathing and Cleanliness, and Mental Hygiene.

This is a particularly good text and should well serve the purpose of a basic text for use by high school pupils, especially if it has been preceded by an adequate discussion of fundamentals during the junior high school years.

CHARLES H. KEENE

The Story of Modern Preventive Medicine—*By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Baltimore: Williams & Wilkins,* 1929. 295 pp. Price, $4.00.

This " sketch," as the author calls it, is not written in the usual historical style. The book is divided into three parts. The first part, after some introductory considerations, takes up the various communicable diseases one by one. Part second is devoted to some of the physical and social conditions of health, such as ventilation, fog, smoke, housing and occupation. Part three considers physiological conditions, taking up the hormones, some deficiency diseases, foods, vitamins, and ends with a chapter on alcohol.

Some of the subjects are well considered, while others are deficient. It would seem that an important matter involving such a great controversy as was waged over the transmissibility of bovine tuberculosis to human beings would require fuller treatment, and a more correct statement of facts.

The book is marred by misspellings of proper names as well as by incorrect designations, such as the Bureau of " National " Industry where " Animal " Industry is meant. Walter Reed is said to have been on the staff of the American Public Health Service, when he was an officer in the Army. Noguchi (page 159) is credited with the discovery of the spirochete supposed to be the cause of yellow fever, and 4 pages after, a

postscript is added giving an outline of the work of Stokes in West Africa, which credits Stokes and his coworkers with having shown that the disease is due to a filter-passing virus, no mention being made of the fact that the Commission headed by Reed proved this some 26 years before. The misstatement that Lazear died from an experimental bite is again repeated, the fact being that Lazear allowed himself to be bitten by a stray mosquito which was not known to have fed on a yellow fever patient.

The book is written in the pleasant style for which its distinguished author is noted, and while it is in the main correct, it is too sketchy and contains too many inaccuracies. Apart from the poor proof reading which is evident, the book is well printed and made up, but one has learned to expect better of the publishers. M. P. RAVENEL

Hows and Whys of Human Behavior—*By George A. Dorsey, Ph.D. New York: Harpers,* 1929. 298 pp. Price, $3.50.

Deluged by letters from individuals who have become curious about human behavior since the recent popularization of the subject, and by requests from parent clubs, professional groups and business organizations, to tell them more about the whys and wherefores of our daily actions, Dr. Dorsey has written this book. It follows closely after *Why We Behave Like Human Beings,* which was one of the non-fiction best sellers of 1925, with increased demand the following year.

The *Hows and Whys of Human Behavior* is written in a much freer, more popular style than Dr. Dorsey's first book. In fact it might be accepted as a chatty discourse on the fundamentals and scientific basic facts of the complexes of human nature, the physiologic and biologic causes and results of man's daily acts. Although the author has purposely camouflaged his science by a popular coat, the reader discovers that he is presenting his subject of behavior psychology with a continuity and logic that immediately dispel any suspicion of his intent to market another best seller crammed with " slap-jack " advice for revamping ourselves so as to become immediate successes on the stock-market, in the political ring or in the social whirl. Instead, he brings out by example and scientific analysis how our behavior in adult life may be conditioned by a single incident in childhood. A man's successes or failures may be conditioned by his early environment.

Running over the chapter headings—How Much of Your Brain Do You Use? Why Do We Fall for Each Other? How Does Your Job Fit You? Why Do You Sleep So Much? Why Do Words Boss You? Why Aren't We the Happiest People in the World?—the reader finds everyday queries answered.

We were all born with a " mechanism engine " ready to go, but where and how it has gone since we were born has been determined by those under whose influence we have lived and also by our own efforts.

> You are what you are today because you were what you were yesterday. . . . You can become something different tomorrow by forcing yourself to be something different today. Your brain is limitless. . . . Load it with new sights, new sounds, new tastes, new vocabularies, new experiences. The more you use your brain, the more brain you will have to use.

The author explains " personality," that over-rated, intangible something that the business world has capitalized upon. He explains, in a manner that laymen can understand and the intelligentsia accept, the glandular mechanism which is responsible in part for our behavior. He does not talk down to his lay reader. He tells him about " impulse," " reflex," " instincts," " mechanisms " and " neurons."

This volume is as fascinating as any detective story. You are carried on from chapter to chapter, because from the outset your curiosity about yourself as an ordinary human has been aroused. Through the pages stalk everyday intimates, colleagues, who you know are the result of the so-called "early conditioning" or of not having subjected themselves to a critical self analysis. If you are in a rut, the book is an antidote. It is recommended not for one reading, but as an addition to your library to which you can turn for frequent mental stimulation and enjoyment.

A. B. TOWSE

Corrective Physical Education for Groups—*By Charles LeRoy Lowman, M.D., Claire Colestock, and Hazel Cooper. New York: A. S. Barnes & Company*, 1928. 521 pp. Price, $4.50.

"This book is presented as a theoretical and practical guide for teachers in the field, and students in training for physical education."

Written by a specialist in orthopedics and two specialists in physical education, it presents a composite view. It tries to emphasize: first, those exercises corrective in type, which may be used by the whole class or group; second, those designed to correct specific weaknesses, or deformities in definite individuals.

The early chapters are devoted to the corrective problem, the influence of posture on growth and development, body statics and types, and the technic of examination.

Several chapters are devoted to the organization of the effort in elementary, junior, and senior high schools, equipment needed, and the type of activity recommended.

A section is set aside for discussion of methods. There are also chapters on corrective games and dances.

This book contains a wealth of material on equipment and methods, and also has a large number of carefully described exercises for various types of defects. It also has an extended bibliography on corrective gymnastics, organization, methods, athletics, play, and posture. There are a considerable number of illustrations of defects and of specific exercises.

CHARLES H. KEENE

Malaria, its Investigation and Control with Special Reference to Indian Conditions—*By Robert Knowles and Ronald Senior-White. Calcutta: Thacker, Spink & Co.*, 1927. viii + 208 pp.

This is a field-worker's manual written by the professor of protozoölogy in the Calcutta School of Tropical Medicine and the Malaria Research Officer of the Central Malaria Bureau of the Government of India. It contains instructions for the diagnosis of malaria in the laboratory, the treatment to be given patients, and practical directions and the theoretical principles useful for the guidance of the malariologist seeking to find mosquitoes, to conduct a malarial survey, and to design, construct and maintain anti-mosquito measures and structures.

The breeding places and distribution of Indian anopheline mosquitoes are described and keys to their adults and larvae are given. Specifications for underdrainage of estates and plantations with a view to the reduction of breeding places of anophelines are supplied as recommended by the Public Works Department of the Malay States. There are 12 pages of bibliography.

The extent to which public health and preventive medicine have developed in India by the Indian Medical Service and by industrial and agricultural enterprises, together with the magnitude of the malarial problem in India and Malaya, have provided a wealth of practical experience of great value.

This book embodies the results of this work and should be of wide use in the tropics and elsewhere, wherever malaria occurs. CHARLES A. KOFOID

Learning Exercises in Food and Nutrition—*By Anna Belle Robinson, A.M., and Florence M. King, M.S. New York: Heath,* 1928. 164 pp. Price, $1.20.

The authors, members of the faculty of home economics education in the University of Illinois, have given in this small volume lessons in food values, meal planning, and cooking, based on actual experiments in their own classrooms. The book has been prepared with the student in mind. However, it will serve the teacher of home economics who is looking for new ways of coördinating and presenting her material and furnish an outline of definite objectives in her work. Menus for the baby, the adult, the family, the invalid, and the convalescent are suggested. The economic side of meal planning is considered. A meal score card has been worked out, but the unique feature is the grocery store score card. The appendix includes simple and varied recipes adapted to the average American family budget. A. B. TOWSE

Dairy Bacteriology—*By Bernard W. Hammer, Ph.D. New York: Wiley,* 1928. 473 pp. Price, $5.00.

As stated in the preface, this book contains the material offered in the beginning course in dairy bacteriology at Iowa State College, to be preceded by general bacteriology, which is necessary to a clear understanding of the subject. The student is also expected to have some knowledge of the standard methods of bacteriological examination of milk. Especial attention is given to the fermentation of milk which is so essential to successful dairy practice.

The table of contents, and the number of pages devoted to each subject, show that all the essentials are fairly considered. The bacteriology of milk products, including evaporated, condensed and powdered milks, is adequately treated. The last chapter is devoted to various tests which are essential in dairy practice.

We would suggest that the tendency to limit the term Malta fever to the disease carried by goats and produced by the *Br. melitensis* be recognized, that undulant fever be more fully recognized, and the term included in the index.

The book is written in clear language, is admirably adapted to the purpose for which it is designed, and can be recommended without hesitation. The printing, make-up and illustrations are excellent. M. P. RAVENEL

Nutrition in Health and Disease for Nurses—*By Lenna F. Cooper, B.S., M.H.E.; Edith M. Barber, M.S.; and Helen S. Mitchell, Ph.D. Philadelphia: Lippincott,* 1928. 574 pp. Price, $3.00.

The comprehensive nature of nutrition in health and sickness is simply and adequately presented in this volume. The facts are correctly given, and the presentation of the material is clear, understandable and substantiated by authoritative references, illustrations, tables and charts.

Although the work is intended as a manual for the student nurse, its value as an authentic reference for the various types of professional workers who need such information and yet are not nutrition specialists cannot be over-emphasized.

That the authors had clearly in mind the purpose for which the text is intended is indicated by the arrangement as well as content of the book. The individual chapters are complete in themselves and of high quality.

Part I deals with the principles of nutrition and presents the newer ideas based upon recent experimentation and

study, as well as upon the established knowledge of earlier research.

Part II has to do with food selection and the practice of dietetics, beginning with the development of cookery and the service of food, and passing on into menu planning and hospital dietaries.

Part III is confined to diet in disease. It includes the prevailing practices of leading physicians in nutrition as applied to disease.

Part IV includes the principles of cookery for the sick and convalescent, providing recipes for small quantities, since the nurse usually prepares food for only one person.

The Appendix contains tables of food values, and of 100-calorie portions, as well as practical suggestions for instructors of nutrition in schools of nursing.

There is a good Index. The printing and make up of the book are good. It should be of interest to a great variety of readers, including the thoughtful housewife, whose responsibilities to her family should stimulate her to understand more concerning the principles of nutrition and how to apply them to her needs. EMILIE G. ROBSON

Chemistry in Medicine—*Edited by Julius Stieglitz. New York: The Chemical Foundation Inc.* 757 pp. Price, $2.00.

The book is aptly described by its subtitle, "A Coöperative Treatise Intended to Give Examples of Progress Made in Medicine with the Aid of Chemistry." The point of view is thus medical rather than chemical, and the book can be read with understanding by those who have no chemical training beyond an introduction to the subject.

While the book is avowedly propaganda, the unfolding of the many examples of "progress in medicine with the aid of chemistry" is done in such a manner as to include much general information. It is not, nor does it claim to be, of a nature to stimulate the reader toward contributing to this medical progress in any specific technical way, though problems often suggest themselves during perusal. Certainly the magnitude and the extent of the contributions of chemistry to medical progress will be deeply impressed upon even the most casual reader.

There are 10 chapters, a number of which include several "articles." The first 3 chapters are general, treating respectively the significance of chemistry and its methods of attack, heredity and development, and the human body as a machine. Chapter IV might well have been included as one of the articles in chapter V, which in 4 articles treats of the conquest of rickets, scurvy, pellagra and beriberi.

Chapter VI includes a series of 8 articles on the various hormones, the chemical regulators of the body. Chapter VII, on the policing of civic life in the laboratory, has 5 articles on the laboratory control of water supply, foods, drugs, industrial poisoning, and sewage disposal. Chapter VIII, with 7 articles, treats of the alleviation of suffering. Subjects dealt with include anesthetics, soporifics and chemical aids for certain organic functional troubles.

Finally, chapters IX and X deal with the field of the war on invading germs. A series of 10 articles is given to the discussion of immunological and chemotherapeutic studies.

Although a number of authors have contributed, unity of plan is apparent in the assembling, the unevenness so often seen in such works having been reduced to a minimum. We have the benefits of diversified authority coupled with uniformity.

The one glaring example of editorial failure is in chapter IV, written by McCollum and Simmonds, on the history of the discovery of the vitamins. The names of Hopkins, Steenbock and Hess are not even mentioned, and Funk gets only a somewhat casual reference, which is derogatory.

ALLEN E. STEARN

The Daily Health Builder—*By C. Ward Crampton. New York: Putnam,* 1928. 161 pp. Price, $1.50.

This book is a handy, safe guide for the adult who is wise enough to go to his own physician for a health examination, and fortunate enough to have a physician who distinguishes between such an examination and the one devoted entirely to discovering disease—he is still more fortunate if that physician can and will prescribe the particular follow-up indicated by the findings of that examination.

All of these are premises set forth by Dr. Crampton and which the lay individual is supposed to accept before using the book. In short, while the book, entertainingly written, fully illustrated, may be easily followed by any individual, that individual should look upon any exercise askance which is not prescribed by his physician to meet his needs. Providing the ones set forth by Dr. Crampton do meet these needs he will find the reasons *why* clearly and simply stated. The fact that Dr. Crampton has discerned a need for such a text is a wholesome sign of intelligent thinking on health by the lay public.

LENNA L. MEANES

The Facts against Compulsory Vaccination—*By H. B. Anderson. New York: Citizens Medical Reference Bureau,* 1929. 127 pp. Price, $1.00.

Most of the sentences and paragraphs in this book are "quotations" or extracts from a great variety of sources, including public health officers, reputable physicians and scientists, the Constitution of the United States of America, the Declaration of Independence and other more or less official documents. In a few cases the documentation is by means of photographic copies of *marked* originals, although there is no reason to question the accuracy of the citations. The author's work was largely that of compiling and editing. In terms of his purpose, which is ostensibly to place the practice of vaccination upon a voluntary rather than a compulsory basis, but in reality to discredit the practice of vaccination in general and medical science by indirection, he has done what might be called devilishly well. That is to say, he has applied cunning and a certain sophisticated naiveté, which is irresistibly convincing to the uncritical, and which leaves the impression of a well-knit case with no room for argument. He seems indeed to have rested his case for the most part on the statements of the "doctors" themselves.

The book presents two serious defects of structure. The author offers a series of major propositions or theorems, in bold face type and boxed headings, to his main divisions and subdivisions. These theses are immediately followed, without any argument or exposition, by supporting documents or extracts from the more or less reliable and relevant authorities; and in these extracts certain passages are again placed in bold face type. The reader is instructed at the start that the main argument is to be found in the bold type, and that one can follow the essential story by judiciously skipping with the aid of this simple device—"It is not necessary, therefore, to read the light face type except where questions arise regarding the accuracy of any assertion contained in the headlines, in which case the facts are readily available." Inasmuch as the "assertions" are in the nature of conclusions or inferences, while the "facts" are presented as citations from authorities—authentic enough for the most part—the trap ought to click nine times out of ten or thereabout. The structural defects are that the documents do not always warrant the conclusions presented, and the bold face type repeatedly indicates ulterior motives. A different distribution of typographical emphases in precisely the

same material would give the unprejudiced reader a totally different set of conclusions. In a few cases one may question the selection and arrangement of statistical data (as Mr. Anderson himself invites us to question *official* statistics), but the fatal defect is present even where the documents are unimpeachable.

From the point of view of the public's basic concern in the question, this book illustrates one of democracy's major difficulties. Attacking compulsory vaccination primarily in terms of the rights of individuals to choose their own opinions on medical matters, the author might consistently build up a case for the doctrine that each one of them has a right to go to the devil or to his grave in his own way—many eminent leaders of thought would then agree with him. When he starts, however, to stress the uncertainties and ambiguities and risks that surround the history of vaccination, he shifts his position from one of civil liberty to one of technical reliability on the part of the medical profession. He is, after all, not so much concerned with the abstract principle of liberty as he is with combating the biological sciences as religious systems; and here, as everybody knows, one "opinion" is as good as another—in a democracy.

We should have more regard for the writer's intellectual integrity if we did not happen to know that he is a confirmed prohibitionist; that is to say, he is willing to agree with you and me that the machinery of government may be properly used to enforce or constrain in regard to details that we accept; but he will insist with us that it is very, very wicked for the government to use its power to enforce upon us something you and I—and Mr. Anderson—do not like. The issue eventually comes down not to an abstract principle of civil or political *right,* but to the practical question of the relative efficacy and harmlessness of a technical procedure—in this case vaccination. Mr. Anderson gives the unsuspecting reader not only serious doubt as to whether vaccination ever did or could prevent smallpox, but an uncomfortable feeling that vaccination actually kills more people than would die of smallpox—*if there were no vaccination.* Any person who (1) knows the facts, (2) feels responsible for the health and welfare of others, and (3) reads this book, will there and then either (a) feel that an outrage has been committed, or (b) withdraw to his solitude to inquire whether after all people do not get about what they deserve.

B. C. GRUENBERG

The Human Machine in Industry—*By Richard T. Dana, assisted by Arthur P. Ackerman. New York: Codex Book Company, Inc.,* 1927. 312 pp. Price, $4.00.

The authors state that the purpose of this book is to make more readily available those facts which bear upon the capabilities and limitations of mankind for work, to the end of promoting the efficiency of management and the welfare of labor. The general propositions are—first, if the man is more comfortable he will be happier and live longer; second, if we properly control the conditions of his comfort, fatigue, and health, he will turn out more work at less cost.

The subject is divided into Chapters as follows: I. *General principles* concerning the dimensions in capacity of the human machine and its monetary value; II. *Fuel requirements,* with a discussion of the question of food under different conditions of work; III. *Cooling requirements,* with a discussion of climate, a very complete statement of healthful atmospheric conditions and the methods of controlling them according to our latest theories; IV. *Fatigue,* with a competent discussion under numerous headings and relations, showing close familiarity with physiology; V.

Rest periods, to which a discussion of 20 pages is devoted; VI. *Economic hours of work,* in which numerous British and other results are recited; VII. *The relative efficiency of men and women* (18 pages); VIII. *Occupational age limits,* for both sexes, and the various relations of age to work; IX. *Industrial diseases,* in a wholesome discussion of 39 pages; X. *The effect of stimulants on efficiency,* in which alcoholism is especially discussed; and XI. *Morbidity,* covering chief illnesses in relation to various industries, and the corrections and supervision to be recommended.

Each Chapter ends with a valuable set of conclusions which also introduce some new materials. There are numerous tables and graphs, while the work is adeptly headed and sub-headed; the different subjects are well classified. The print of such size and spacing as to be easily legible. Printers' errors are infrequent; repetition is not common; while a thoroughly scientific attitude and fairness is maintained throughout the book.

We could cite omissions such as the "ideal work curve" of Bedford, Leverhulme's "overtime studies," some of the Gilbreths' motion and fatigue studies, and others.

The Index is very inadequate, while on the other hand the Table of Contents is rather too extended and not very useful, since exact pages are not given for the various sub-headings. One is inclined to believe that perhaps disproportionate stress has been placed upon *fatigue* (108 pages) with an additional chapter on *rest periods* of 19 pages, *economic hours of work* 54 pages, *efficiency* 18 pages, *age limits* 17 pages, and *stimulants* 13 pages—all more or less related to *fatigue.* Yet those who consider that all hazards tend toward fatigue will like this arrangement and these inclusions.

Many authorities, boards and reports are cited throughout the work, but there are no reference lists, and no specific bibliography. The work will be found to have collected a considerable amount of valuable and dependable material for industrial managers, teachers and students interested in the field of industrial efficiency from the health viewpoint.

E. R. HAYHURST

Keeping Mentally Fit—*A Guide to Everyday Psychology—By Joseph Jastrow, Ph.D., LL.D. New York: Greenberg,* 1928. 297 pp. Price, $3.50.

This volume consists of a series of daily articles published in the newspapers from October, 1927, to September, 1928, under the direction of the Public Ledger Syndicate.

The author points out that the ways of the mind are good and bad, while mental fitness is a worthy ideal which must be made a practical reality in order to retain our jobs and our content. The need for psychology rests in the fact that meaning is not always found on the surface. The analytical habit of mind makes the psychologist, and attracts minds of similar bent to his findings. There is danger in trying to be all things to all men, claiming dominion and the right to give authoritative advice beyond that which present knowledge justifies and which is often based on past errors. There are many pretenders who have taken the name of psychology in vain, but reaped rich financial rewards through their presumption.

The author was for more than thirty years Professor of Psychology at the University of Wisconsin, and writes from a wide and rich experience. He has a happy art in presenting his ideas and a gift for attractive titles. One will find pretty nearly all questions of everyday life here presented, from complexes to the use of the lipstick.

The articles are grouped under 10

headings. Each one is short and to the point. Everyone will find some puzzle which has bothered him answered in plain language which the non-professional reader can understand.

M. P. RAVENEL

Teachers' Problems in Health Education—*Book I. Teaching How to Get and Use Human Energy—By Thomas D. Wood, M.D., and Marion O. Lerrigo, Ph.D. Bloomington, Ill.: Public School Publishing Co.*, 1928. 128 pp. Price, $0.75.

This book, the first in a series intended primarily to aid in teaching health, deals with the use of big muscles and nutrition in a health education program. The authors promise several of the series, so that none of the important topics of health education will be slighted. When outlined, teachers of the primary and elementary, the junior high and senior high school grades, were had in mind. The book contains much needed basic information for the teacher of health, and offers suggestions for activities that should stimulate the pupils in developing healthy bodies and living healthful lives. This contribution to the too scant field of health education material for teachers will be welcomed.

A. B. TOWSE

Preventive and Corrective Physical Education—*By George T. Stafford. New York: A. S. Barnes & Company*, 1928. 328 pp. Price, $3.00.

This excellent work starts with an introductory argument for a broad and real physical education, rather than a narrow program of athletics only. It emphasizes, too, the need of a thoroughly trained personnel to handle the program. "Nothing has hindered the development of physical education so much as the erroneous idea that because a man has been a professional boxer or a star football player, he will be able to guide the normal growth and organic development of the coming generation."

It also makes a plea for handling cases individually. The idea that corrective gymnastics can be given successfully to massed groups of forty or more is folly.

The pedagogy of preventive and corrective physical education is well presented. It offers thoughts of which all too many practicers of this field of therapy lose sight, namely:

A thorough technical training in physical education is necessary if one is to treat properly the physically defective individual.

In certain cases of malnutrition there is already an overindulgence of physical activity.

One of the objectives of corrective work must be the teaching of self reliance.

The right appeal must be used to secure results.

The need for religiously practicing good hygiene outside of class as well as during class is constantly stressed.

The health of the teacher creates confidence in the pupil.

Teaching health by precept only is a futile task.

In corrective work the pupil is made to understand that his condition is remedied only by the work the pupil performs.

It has also chapters devoted to Physiology of Exercise, Body Mechanics, the Feet, Heart Disturbances, Malnutrition, Constipation, etc., Athletic Injuries, and to other phases of this extensive, complicated, and technical phase of physical education and therapy. Throughout, the author has realized that correction cannot be obtained by exercises alone. Habit, diet, footgear, and various types of electro, thermo, and hydrotherapy are frequently quite as essential.

At the end of each chapter is an extended bibliography of collateral reading.

The book is an excellent treatise for those teachers in physical education who are engaged in corrective work, and for physicians, particularly those largely in contact with adolescent and college youth, who desire more definite information concerning this field of medicine than the ordinary medical curriculum gives. It is well written, printed and illustrated.

CHARLES H. KEENE

The Kahn Test, a Practical Guide—*By R. L. Kahn. Baltimore: Williams & Wilkins,* 1928. 201 pp. Price, $4.00.

As would be expected from the publishers, the general form and appearance of the volume is excellent. The English is clear and concise. The text is presented as a second edition of that part of *Serum Diagnosis of Syphilis by Precipitation* which relates to procedure. The first chapter, which constitutes about one-third of the book, deals with the consideration of the theoretical basis for precipitation tests and a general discussion of the Kahn test. The remaining chapters are devoted to a detailed description of the author's technic. This includes the routine diagnostic test, and the qualitative, presumptive, micro and special procedures for use with serum, as well as the adaptation of the test for spinal fluid. The apparatus required is shown in illustration, and specifications necessary for purchasing are given. The description of the conduct of the work furnishes the minutiae so essential if duplication of results is to be secured. Those conducting the Kahn test will wish to have the volume available for ready reference. RUTH GILBERT

Principles of Sociology—*By Rudolph M. Binder. New York: Prentice-Hall,* 1928. xvi, 609 pp. Price, $5.00.

The author, a professor in New York University, is already well known to students of public health problems through an important treatise, *Health and Social Progress.* He has now produced a general treatise on the principles of sociology. His approach is primarily that of the student of social institutions and cultural development. There is little attention given to geographical, biological, historical, and psychological factors in society and social development, though these influences are touched upon in separate chapters in the first part of the book on "the social population."

The book is in five parts: Social Population, Social Motives, Social Processes, Social Institutions, and Social Aims. The first and the last are of chief interest to students of public health, embracing those portions of the work which treat of biological aspects of social processes and social progress. A special chapter (XXIX) is devoted to The Improvement of Health. The treatment of the biological aspects of society is not, however, as extensive as that in Bushee's *Principles of Sociology* nor as scientific and searching as that in Hankins's *Introduction to the Study of Society.*

The attitude and approach of Professor Binder are those of the social philosopher of the earlier days of sociology, but his materials are more up-to-date than were used by the writers of the last generation. The tone of the book is restrained and conservative, especially on such controversial questions as sex, religion and property.

The work should prove highly congenial to the outlook of the majority of American sociologists and should go far to allay the current conviction that American academic sociology is a disruptive influence in American life and a threat to the morals and well-being of the country. HARRY ELMER BARNES

Old Mother Hubbard and Her New Cupboard—*By Rama V. Bennett. Los Angeles: Los Angeles County Public Health Association,* 1928. 50 pp. Price, $.50.

The famous character of nursery rhymes has been raised to the dignity of custodian of the health of the community, gained by proper nutrition. This attractively prepared volume contains 50 articles on nutrition, with special emphasis on child feeding, all written for the education of the mother, teacher and nurse. The articles first

appeared as weekly contributions in a half-hundred newspapers in Los Angeles County, as one phase of the health education program of the County Tuberculosis Committee and the County Public Health Association. It is a commendable piece of work and shows how an up-and-coming county health department can persuade its editors to educate the public in health. A. B. TOWSE

Growth—*By William Jacob Robbins, Samuel Brody, Albert Gerland Hogan, Clarence Martin Jackson and Charles Wilson Greene. Edited by H. D. Hooker. New Haven: Yale University Press,* 1929. 189 pp. Price, $3.00.

The volume embodies a series of lectures delivered at the University of Missouri under the auspices of the Missouri chapter of the Sigma Xi during the academic year 1925–1926. The five chapters are not in the form of a unified treatment amplified from a single point of view, but each author attempts a fairly comprehensive though fragmentary approach to the subject from a different point of view. The first chapter is largely a definition of growth and delimitation of the problem. It is the only chapter in which the illustrative material is taken from the field of plant life, the remainder of the book dealing almost exclusively with animals, including humans.

In the two following chapters, growth is treated respectively as a statistical process and as a chemical process. The last two chapters are devoted to the morphology and general biology of growth, and the regulating factors in normal and pathological growth.

These several points of view render the book of more general interest than if a single point of view had been maintained, and many workers in the general field of biology should find at least one of the chapters interesting.

Though the chapters are uneven in style and tone, the authors have in many cases succeeded in interweaving some things which are not generally known with others that are matters of fairly general knowledge.

M. P. RAVENEL

Health and Physical Education for Elementary Schools—*By Alonzo Franklin Myers and Ossian Clinton Bird. New York: Doubleday, Doran,* 1928. 342 pp. Price, $1.50.

In their presentation of a modern health education program the authors say:

> We regard health education in the elementary school as including not only formal instruction in health, but also all of the means at the disposal of the school for influencing favorably the habits, attitudes, ideals and knowledge of the child with reference to individual and community health.

To justify this statement they have presented a workable plan, grade by grade, to include the many phases of a well rounded health education program. They have included a chapter on mental hygiene—a commendable point, for too many authors either dodge this subject as outside the pale of an inclusive health program, or because they have not progressed to an appreciation of its importance. The authors who are affiliated with the University of Ohio realize that the success of the public health movement is dependent in large part upon the teaching of this subject in public schools. A. B. TOWSE

The Book of Green Vegetables—*By Mollie Gold and Eleanor Gilbert. New York: Appleton, 1928.* 189 pp. Price, $1.50.

To some who are endeavoring to prepare health meals, green vegetables are only green vegetables; to others they are the foundation of a variety of tasty nutritious dishes. This handy book is a revelation of the variety of ways of preparing green vegetables available throughout the year.

Handbook of Microscopical Technique for Workers in both Animal and Plant Tissues—*Edited by C. E. McClung (with the assistance of 24 Contributors). New York: Hoeber,* 1929. xiv + 495 pp., 43 figs. Price, $8.00.

The text is divided into two parts. The first is for the inexperienced worker who needs guidance in the fundamental principles of making microscopical preparations, including the processes of fixation, dehydration, imbedding, sectioning, mounting, staining, serial sectioning, the preparation of whole mounts and other non-sectioning methods.

The second and more extensive part deals with special methods for the more experienced worker. Special chapters, or parts thereof, deal with microinjection and microdissection by Chambers, with bacteriological methods by Conn, Mallory and Parker, with vital stains by Foot and supravital stains by Sabin, and with botanical microtechnic by Taylor.

Cytological methods are treated by McClung, Allen, Hance, McNabb and Cowdry, embryological methods by McClung and Allen, histological methods as applied to the various tissues by a well selected group of specialists in that field, and protozoölogical methods are presented by Wenrich. A general discussion of fixation and fixatives is given by McClung and Allen, and a very valuable account of stains and staining by McClung. Aniline dyes are dealt with by Conn of the Committee on the Standardization of Stains.

The book is indispensable for all workers using microtechnic in bacteriology, biology, botany, cytology, embryology, histology, pathology, parasitology and zoölogy. It should be in the library of every public health laboratory and laboratory technician. It is the product of the practical experience of eminent specialists and is authoritative. Furthermore, it shows evidence of careful editing and the effort to include minor practical details of manipulation on which the successful preparation of excellent microscopical preparations so often depends. It is quite up to date in the inclusion of recently developed fields and special methods.

CHARLES A. KOFOID

Grundzüge der Hygiene—*By Dr. Max Engling. (2d ed.) Berlin: Urban & Schwarzenberg,* 1929. xiv + 426 pp., 152 figs. Price, 14 marks. Bound, 16.40 marks.

A second edition of this recently published treatise on the elements of hygiene has given opportunity for considerable increase in the illustrations. The sections on communicable diseases and those of medical importance have been expanded. Because of the increased interest among German youth in sport, a section has been added on the hygiene of exercise. The chapter on disinfection has an added section dealing with control of animal plagues, including a full account of delousing methods, and defensive measures against fleas, bedbugs, flies, mosquitoes, and rats and mice. The book is quite up-to-date on the latest German practices in laboratory and sanitary matters. It covers a very wide range of subject matter germane to hygiene and is a valuable addition to the library of the public health officer, technician and the sanitary engineer.

CHARLES A. KOFOID

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

California—By a legislative act of 1927, the State Board of Health was reorganized to become the State Department of Public Health, guided by the State Board of Health, composed of 7 members. The status of communicable disease in California during the past two years has been uniformly satisfactory, according to the 30th biennial report for the period ending June 30, 1928.

Although during the period of the report there was no outbreak of plague among human beings, this disease is a live subject, and "the discovery of large numbers of infected ground squirrels in many counties of the state emphasizes the fact that an endemic focus of this disease exists on the Pacific Coast." It has been four years since a water-borne outbreak of typhoid fever appeared in the state. Nearly all cases are milk-borne or are contracted through contact with cases or carriers. There were but 2.5 deaths per 100,000 population from this disease in 1927. Rabies continues to be a problem, with 376 rabid animals discovered and 1 human death, in 1927.

It is not surprising to find a high tuberculosis rate (140.7 per 100,000), although the trend is downward.

This is the penalty we pay for having an enviable climate. Large numbers of advanced cases of tuberculosis are imported into California each year. About 7 per cent of all tuberculosis deaths in the state annually are of persons who have lived within the state for less than one year, and about 23 per cent are of persons who have lived within the state from one to four years.

The burden of caring for non-resident tuberculosis cases among indigents has fallen particularly heavily upon the counties of southern California.

The report describes the important work done in sanitation during the St. Francis Dam disaster. The flood waters attained a maximum depth of about 125 feet, and traveled, in a solid wall, down San Francisquito Canyon at the rate of 18 miles an hour. As soon as word of the disaster was received, representatives of the department left Los Angeles and San Francisco simultaneously. County departments also participated in the work. Milk supplies were ordered pasteurized; water supplies and sewage disposal plants were safeguarded; and immunization against typhoid fever (3,106 individuals) was instituted. General relief measures were carried on under the direction of the Red Cross, The American Legion, and other local organizations. No cases of communicable diseases as a result of flooded conditions occurred.

Making the Annual Report Worth While—Of three annual reports of health officers which reached the desk of the editor of *Health News* simultaneously, one is almost entirely in the form of a tabulated statement of morbidity and mortality, clinic statistics and financial disbursements. While undoubtedly there are matters of importance hidden in its columns, it forms as interesting reading as a few pages from the dictionary and will be found useful chiefly for purposes of reference and comparison.

In contrast to this report, a health officer of a town in Orange County comments at length on the new milk regulations in his report, indicates the improvements in the supply which have resulted by their enforcement, and discusses in an interesting manner the various clinics held during the year and the results obtained therefrom; he also calls attention to the necessity of holding dogs in quarantine where humans have been bitten, basing his remarks on a

case where the dog was killed too soon and the diagnosis thereby greatly delayed; all this in addition to routine matters which are discussed in a readable manner.

Much the same comment as the last can be made on the report of a health officer of a village in Tioga County. Five closely typewritten pages give a complete outline of his official activities in a conversational style that invites perusal. His remarks on the new milk regulations are worth repeating:

> The application of the new milk code has been the outstanding feature of the past year's work. At first its requirements seemed to be drastic, but as more thought was given, it was found that regardless of its wording it could be reduced to the simple terms "Cleaner and safer milk for the consumer." When one considers the epidemics at Montreal, Canada, and at Lee, Mass., no measure can be too drastic to secure wholesome milk.—*N. Y. Health News,* Feb. 11, 1929.

Dayton, O.—Dayton's 1928 review states that increased emphasis is being given to the need for selling health to the people.

> It is realized that health organizations have very largely covered the field of group health protection. The greatest need now is to have the individual thoroughly acquainted with the means of promoting good health. Individual protection must be practised to make further progress in lengthening the span of life. Every employee of the health department is a salesman of health.

Nurses made 2,466 prenatal calls, the highest number recorded. The Miami Valley Hospital refers prenatal patients from its clinic for visiting nurse follow-up in the home. During the school vacation months, the nurses visited every crippled child in the city to see that proper care was given.

On July 1, the final enforcement of the ordinance requiring that all milk sold in the city be from tuberculin tested cows was begun. Of 2,200 dairies supplying milk to the city, only 80 were required to discontinue sale because of not having complied with the ordinance. A new score card has been devised for food establishments which is said to have increased the efficiency of inspection. Thirty-five per cent of the score is given for proper equipment and 65 per cent for cleanliness measures.

United States Public Health Service—The 57th annual report of the Surgeon General covers the 130th year of the existence of the Service. There were no pandemic outbreaks of any disease, and no country with a modern public health organization was affected by the spread of any of the pestilences which have scourged the world in the past. There was an increase in diphtheria prevalence in practically all European countries, as well as in Australia and certain countries on the Mediterranean coast of Africa. In contrast, there was no general increase in the prevalence of scarlet fever. Infantile paralysis was unusually prevalent in some countries of Europe, particularly Germany, Austria, and Rumania, but did not become epidemic. The necessity for coöperation among the nations of the world in preventing the spread of diseases dangerous to the public health has been more widely recognized during recent years than formerly.

During the calendar year 1927, health conditions were relatively good in the United States, and preliminary figures indicate that the general death rate was the lowest ever recorded. There was, however, an increase in the prevalence of diphtheria which continued throughout the year, and during the first few months of 1928.

> Again the United States has the unenviable distinction of reporting more cases of smallpox during the year than any other country in the world from which reports are received, except India. It is difficult to understand why this condition is allowed to continue year after year. A large percentage of the property in this country is insured against loss by fire, and

a man who fails to provide for his family by taking out life insurance is censured; yet when smallpox is introduced into a community in the United States, it usually finds many victims who have never been vaccinated and others who have not been vaccinated for many years. Nearly 34,000 cases of smallpox in the United States in the calendar year 1927 testify to the neglect of the people to utilize vaccination, the known means of preventing this disease.

Tuberculosis had a new low record. The death rate in 41 states of 77.3 was 7 per cent lower than the rate in these States for 1926, and 8 per cent lower than for 1925. The decline of typhoid fever affords a striking example of the results of practical application of the principles of modern sanitary science.

A somewhat detailed account of investigations of public health problems deserves careful study. Among the important recommendations of the report is one relating to the collection of sickness reports. Legal authority has existed for more than 35 years for the collection by the Service of information relating to the prevalence of disease, but there is no specific appropriation for the purpose. The establishment of a registration area for diseases dangerous to the public health would do much to secure uniform, trustworthy, and prompt reports, and it is recommended that an appropriation be granted for this purpose.

BOOKS RECEIVED

COMMUNITY HYGIENE. By Dean Franklin Smiley and Adrian Gordon Gould. New York: Macmillan, 1929. 350 pp. Price, $2.00.

THE HARVEY LECTURES. Delivered under the Auspices of The Harvey Society of New York, 1927–1928. Baltimore: Williams & Wilkins, 1929. 280 pp. Price, $4.00.

IMPROVISED EQUIPMENT IN THE HOME CARE OF THE SICK. By Lyla M. Olson. Philadelphia: Saunders, 1928. 109 pp. Price, $1.25.

THE HUMAN MACHINE IN INDUSTRY. By Richard T. Dana. New York: The Codex Book Co., 1927. 312 pp. Price, $4.00.

REPORT OF THE INTERNATIONAL CONFERENCE ON CANCER. London, July 17–20, 1928. Held under the Auspices of the British Empire Cancer Campaign. New York: William Wood, 1928. 588 pp. Price, $12.00.

GETTING READY TO BE A MOTHER. (2d ed. rev.) By Carolyn Conant Van Blarcom. New York: Macmillan, 1929. 286 pp. Price, $1.75.

PUBLIC HEALTH AND HYGIENE. A Student's Manual. By Charles Frederick Bolduan. Philadelphia: Saunders, 1929. 312 pp. Price, $2.75.

TRAINING CHILDREN. By William H. Pyle. New York: Century, 1929. 206 pp. Price, $1.75.

LIVING WITH THE LAW. By June Purcell Guild. New York: New Republic, 1928. 266 pp. Price, $1.00.

NATIONAL HEALTH SERIES.

WHAT EVERY ONE SHOULD KNOW ABOUT EYES. By F. Park Lewis, M.D.

DIABETES AND ITS TREATMENT. By Frederick M. Allen, M.D.

CARE OF THE MOUTH AND TEETH. By Harvey J. Burkhart, D.D.S. New York: Funk & Wagnalls, 1928. Price per copy, $.30.

AN APPRAISAL OF PUBLIC HEALTH ACTIVITIES IN DENVER, COLO. Including the Activities of Official and Voluntary Agencies for the year 1927. By James Wallace, M.D., for the Committee on Administrative Practice of the American Public Health Association. New York: A. P. H. A., 1928. 102 pp. Price, $.50.

YOUR TEETH. By Charles I. Stoloff. New York: Dutton, 1929. 224 pp. Price, $2.50.

HEALTH AND PHYSICAL EDUCATION. By A. F. Myers and O. C. Bird. New York: Doubleday, Doran, 1928. 342 pp. Price, $1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Women in Industry—The ability of women to do hard work in industry is discussed from experience in Great Britain. The plea is made for better midwifery to prevent postpartum disabilities which unfit women for industrial positions.

ADAMSON, R. H. B. The Health of Women and Girls in Relation to Industry. J. State Med. 37, 2: 107 (Feb.), 1929.

Non-Official Health Agency Functions—In addition to the accepted investigational, demonstrational and educational functions of the voluntary agency, the author raises the question whether private agencies may not carry out other health services, always under guaranteed official control.

ARMSTRONG, D. B. The Field and Functions of the Private Health Organization. New England J. Med. 200, 8: 387 (Feb. 21), 1929.

Nutrition and Pneumonia—In a study conducted in a child-caring institution, nutrition (in children under 5) appeared to bear no relation to the incidence of pneumonia. Rickets, too, did not predispose to pneumonia. Nutritionists please take notice!

BARENBERG, L. H., et al. The Relationship of Nutrition to Pneumonia in Infancy and Childhood. J. A. M. A. 92, 6: 440 (Feb. 9), 1929.

The Laboratory's Contribution to Longevity—An Irishman's search for all the ways in which bacteriology has added to the expectation of life gathers up every scrap of credit possible and lays it at the door of the laboratory. The paper is really a plea for better laboratory service in Ireland, but one would never guess it at the beginning.

BIGGER, J. W. The Expectation of Life and the Bacteriological Laboratory. J. State Med. 37, 2: 76 (Feb.), 1929.

Industrial Morbidity Experience—Respiratory diseases were the cause of 41.8 per cent of claims for the industrial illness benefits; digestion diseases, 13.7 per cent; and non-industrial accidents, 10 per cent; (virtually two-thirds) of the benefits paid by associations reporting to the U. S. Public Health Service. The incidence rates increased during the years 1921 to 1927. The study presents many other interesting findings.

BRUNDAGE, D. K. Sickness among Industrial Employees. Pub. Health Rep. 44, 8: 387 (Feb. 22), 1929.

Morbidity Survey—A sickness survey in rural New York made by the State Department of Health demonstrated the numerically unimportant position of the reportable diseases, and suggested that more attention be paid by health officials to the non-reportable conditions.

DE PORTE, J. V. Sickness in Rural New York. J. A. M. A. 92, 7: 522 (Feb. 16), 1929.

Sensitization by T–A Mixture—Persons immunized by toxin-antitoxin mixture were sensitized to horse serum in 74 per cent of cases, whereas of untreated persons only 18 per cent were found sensitized. The reactions in the treated group were more severe than in the untreated. The use of toxoid or goat antitoxin is urged.

GORDON, J. E., and GRESWELL, S. M. To What Extent Do Toxin-Antitoxin Mixtures Sensitize to Therapeutic Serum? J. Prev. Med. 3, 1: 21 (Jan.), 1929.

School Ventilation—Another study has been made indicating a greater amount of respiratory illness in mechanically ventilated school rooms than in those with window ventilation. This

study confirms the findings of New York Commission on Ventilation. How many more times will these findings have to be confirmed before our school ventilation methods become more civilized?

GREENBURG, L. A Study of the Relationship between Type of Ventilation and Respiratory Illness in Certain Schools in New Haven, Connecticut. Pub. Health Rep. 44, 6: 285 (Feb. 8), 1929.

Results of Breast Feeding—In a study of 383 elementary school children, those artificially fed were found inferior both physically and mentally to the breast-fed; they were more poorly nourished, more susceptible to disease, slower in mental development. This seems "too good to be true."

HOEFER, C., and HARDY, M. D. Later Development of Breast Fed and Artificially Fed Infants. J. A. M. A. 92, 8: 615 (Feb. 23), 1929.

Parasitism in Philadelphia—Intestinal parasitism may be found frequently in clinic patients in American cities, the condition being by no means confined to tropical regions. In this study numerous infections with amebas and giardia were detected.

DE RIVAS, D., and FIFE, C. A. Intestinal Parasitism in Philadelphia. J. A. M. A. 92, 8: 624 (Feb. 23), 1929.

Respiratory Infections and Rheumatism—Evidence is offered which indicates close association between infections of the upper respiratory tract and rheumatic fever. Care in a convalescent home does not reduce infections after the child is returned to his home.

MCCULLOCH, H., and IRVINE-JONES, E. I. M. The Rôle of Infection in Rheumatic Children. Am. J. Dis. Child. 37, 2: 252 (Feb.), 1929.

Treatment of Market Wastes—The method adopted in Birmingham, England, for transforming wastes from meat markets, slaughterhouses, and vegetable markets into salable fertilizer and animal feeds is described in detail.

WEAVER, W. The Treatment of Organic Waste. J. Roy. San. Inst. 49, 8: 478 (Feb.), 1929.

Vitamin Content of Milk—Human and cow's milk contain about the same amounts of vitamin A, the former only about half as much vitamin B as the latter. Both are deficient in the antirachitic factor. The vitamins in cow's milk are apt to be dissipated by adverse treatment. The effects of a vitamin deficient diet are discussed.

MACY, I. G., and OUTHOUSE, J. The Vitamin Content of Milk Used in Infant Feeding. Am. J. Dis. Child. 37, 2: 379 (Feb.), 1929.

Scarlet Fever Carriers—In a study of 1,011 cases of scarlet fever coming from 343 families, it was found that return cases occurred when convalescents were sent home with hemolytic streptococci demonstrable in the throat. Hemolytic streptococci survive long after the convalescent period in about 60 per cent of the patients.

MORIWAKI, G. The Relationship of Hemolytic Streptococci to the Spread of Scarlet Fever. J. Infect. Dis. 3, 1: 1 (Jan.), 1929.

Spray Painting Hazards—This paper describes the booths and ventilation apparatus used in spraying lacquers on automobile bodies.

VOGT, J. H. Ventilation in Connection with Applying Coating and Finishing Materials to Automobiles by the Use of Atomizers and Compressed Air. Indust. Hyg. Bull. (N. Y. Dept. of Labor) 5, 8: 29 (Feb.), 1929.

NEWS FROM THE FIELD

TULAREMIA IN RUSSIA

TULAREMIA, hitherto thought to exist only in the United States and Japan, has been found to exist in Asiatic Russia. *B. tularense,* the causative organism of tularemia transmitted to humans by rabbits, was discovered in tissue received from the Sanitary Bacteriological Institute of Sverdlovsk (Ekaterinburg) in the Ural region of Asiatic Russia.

EPIDEMIC OF SMALLPOX IN BOMBAY

GREAT alarm has been felt in Bombay on account of a severe outbreak of smallpox, which has caused 247 deaths out of 500 cases since January 1. One hundred new cases were reported the last week in February. Six thousand persons have been vaccinated since the first of the year in the 20 vaccination stations established throughout the city.

NEW YORK LEAGUE FOR THE HARD OF HEARING HAS NEW HOME

THE New York League for the Hard of Hearing has moved its offices to the 11th floor of the Grand Central Palace. The Grand Central Palace, famed for 17 years as housing many great exhibitions, has been purchased and converted into an office building. Social agencies have been particularly welcomed.

CONVENTION OF THE AMERICAN PHYSICAL EDUCATION ASSOCIATION

THE convention of the American Physical Education Association, which takes place at Yale University, New Haven, Conn., April 17–20, will be comprised of delegates from all over the United States. The convention will be addressed by prominent authorities in the field of physical education, the general topic being, "Modern Trends in Physical Education."

INCREASE IN PREVALENCE OF SPINAL MENINGITIS

ON March 11, in its weekly report on communicable diseases, the U. S. Public Health Service announced an increase in the prevalence of cerebrospinal meningitis throughout the United States. For the week of February 10, 251 cases were reported by 45 states as contrasted with 94 cases reported for the same week of 1928. Ninety-seven cities of more than 31 million population reported 143 cases the same week this year as against 42 cases during the same period last year.

SANITARY SURVEY OF GREECE

THE Government of Greece has requested the League of Nations to make a study of sanitary and health needs of her population and make recommendations for a national health service. A commission appointed by the Health Organization of the League started work in Athens on February 15. L. L. Lumsden, M.D., of the U. S. Pubice Health Service, and Haven Emerson, M.D., of New York, were elected to serve as members of this commission. Owing to injuries received in an automobile accident, however, Dr. Lumsden was unable to go, and A. J. McLaughlin, M.D., of the U. S. Public Health Service, was chosen to take his place.

DEATH OF PROFESSOR PIRQUET

BARON Clements Pirquet, noted scientist and professor at the University of Vienna since 1911, and his wife died of coal gas poisoning at their home in Vienna, on February 28.

Professor Pirquet, who was 55 years old, was well known in Europe and the United States for his treatment of crippled children, for which purpose he established a clinic in Vienna, and later a model of this was founded here. His most important discovery was the "Pirquet Reaction" method of inoculation.

Professor Pirquet was also the author of several valuable books, *Allergie, Cutaneous Tuberculin Tests,* and *New System of Feeding.*

Because of his international reputation Professor Pirquet was mentioned as a possible candidate for the presidency of the Austrian Republic at the elections last November.

CONFERENCE ON PUBLIC HEALTH OF THE A. M. A.

THE following were representatives of the American Public Health Association at the Conference on Public Health of the American Medical Association, in Chicago, Ill., March 29–30: George W. Fuller, *President,* A. P. H. A., M. P. Ravenel, M.D., Louis I. Harris, M.D., W. F. Walker, D.P.H., Henry F. Vaughan, D.P.H., John E. Monger, M.D., Professor E. O. Jordan, and Homer N. Calver.

DELTA OMEGA LECTURE

THE first Delta Omega lecture was given at the Yale School of Medicine on March 8, by James A. Doull, M.D. The subject of Dr. Doull's discourse was, "Factors in the Selectivity of Diphtheria and Scarlet Fever." Professor C.-E. A. Winslow presided at the meeting, which was attended by many from the medical school and department of public health.

The second of these lectures will be given at the Massachusetts Institute of Technology on April 12, by George T. Palmer, D.P.H., on the School Health Study of the American Child Health Association.

SECOND INTERNATIONAL CONGRESS ON MALARIA

THE French Ambassador, Paul Claudel, has announced that the second international congress on malaria will be held at Algiers in May, 1930. This occasion will celebrate the fiftieth anniversary of the discovery of the malaria parasite by M. A. Laveran in Algeria, and the centennial of French Algeria as well. Representatives from many nations will convene at this time with the purpose of controlling the existing prevalence of malaria.

PERSONALS

DR. HENRY P. WALCOTT, for over 25 years president of the Massachusetts General Hospital, resigned his position on February 6 and was made Honorary President of that institution. Dr. Walcott has devoted a great part of his 91 years to public health interests. During his career he has been president of the Massachusetts Medical Society; first chairman of the Massachusetts Board of Health; chairman of the Metropolitan Water Commission; Fellow of the Harvard Corporation. He is an Honorary Fellow of the American Public Health Association.

ISAAC D. RAWLINGS, M.D., Director of Public Health of Illinois for eight years, resigned this position February 14 to become First Assistant Health Commissioner of the city of Chicago. Before his appointment as State Director of Public Health in 1921, Dr. Rawlings was affiliated with the Chicago Health Department for more than 20 years.

WILLIAM DE KLEINE, M.D., has become medical assistant to the vice-chairman of American National Red Cross, and will carry on the growing program of the Red Cross in health education.

S. E. FROST has taken charge of publicity for Philadelphia Health Council.

PHILIP P. JACOBS, Ph.D., as director of Publications and Extension Service, will be responsible for periodical publications, the training of workers, and vocational service of the National Tuberculosis Association. Elizabeth Cole and Eleanor B. Conklin will be assistants.

H. E. KLEINSCHMIDT, M.D., as director of the newly formed Health Education Service of the National Tuberculosis Association, will be responsible for all adult health education activities, lay and medical. A. Scheffer, Jr., will be assistant.

EDWIN C. LANIGAN is chief of public health education, New Jersey Department of Health.

RUTH WARE is director of health education, Y. W. C. A., Syracuse, N. Y.

HELENA L. WILLIAMS, of National Tuberculosis Association publicity staff, is now with Wales Advertising Co.

DR. W. A. CLAXTON, formerly Health Officer of Miami, Fla., was appointed to take the position of Health Officer of Morgan County, Ill.

DR. W. L. HOLT, Portland, Me., has been appointed Director of the Division of Communicable Diseases and Social Hygiene of the State Department of Health.

DR. CHARLES H. HALLIDAY, Chief Epidemiologist of the California State Department of Health, has been appointed Deputy State Health Officer of Anne Arundel County, Md.

GUSTAVE WINDESHEIM, M.D., Fellow, A. P. H. A., was reëlected President of the Wisconsin State Board of Health at the annual meeting.

DR. ROBERT S. BREED and PROFESSOR JAMES D. BREW have been appointed consultants to the N. Y. State Department of Health on Dairy Sanitation. Dr. Breed, who is chief in research at the N. Y. State Agricultural Experiment Station, was chairman of the section on dairy bacteriology at the World's Dairy Congress last June. James D. Brew, Professor of Dairy Industry Extension at the College of Agriculture, Cornell University, was a member of the committee which prepared the revision of the N. Y. State Milk Code, effective last July.

C. A. HARPER, M.D., Fellow, A. P. H. A., continues in his twenty-sixth year as State Health Officer of Wisconsin.

CONFERENCES

April 22–26, Seventh Annual New England Health Institute, Hartford, Conn.

April 29, American Society for Clinical Investigation, Atlantic City, N. J.

May 2–4, American Surgical Association, Cleveland, O.

May 7–8, Association of American Physicians, Atlantic City, N. J.

May 14–17, American Psychiatric Association, Atlanta, Ga.

May 27–31, National Tuberculosis Association, Atlantic City, N. J.

June 13, International Hospital Congress, Atlantic City, N. J.

June 17–21, Annual Convention, American Hospital Association, Atlantic City, N. J.

June 24–28, American Water Works Association, Toronto, Can.

July 8–13, International Council of Nurses, Montreal, Can.

July 13–20, Fortieth Congress and Exhibition of the Royal Sanitary Institute, Sheffield, England.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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The Mortality Trend in the Industrial Population*

LOUIS I. DUBLIN, PH. D., FELLOW A. P. H. A.

Statistician, Metropolitan Life Insurance Company, New York, N. Y.

IN THIS paper is presented a summary of a report just completed on the mortality experience among 3¼ million white male wage earners insured in the Industrial Department of the Metropolitan Life Insurance Company. The study covered the 3-year period 1922 to 1924 inclusive, and is an exact parallel of one covering the 3-year period 1911 to 1913. Taken in conjunction with this earlier work, our present investigation makes available a picture of mortality probably unsurpassed in detail among American wage earners during the years when the movement for better industrial hygiene was being widely extended. It should be kept in mind that the industrial policy holders who formed the basis of the study consist of people in the United States and Canada who earn their livelihood in our manufacturing plants, mines, transportation industries and other mechanical pursuits. They constitute a fairly homogeneous social and economic group which may be described as the urban wage earning population.

The adult males of this class have a higher mortality and diminished longevity than those in other forms of employment. As is shown in Table I, the mortality rate for the group of insured males is higher than that of all males living in the U. S. Registration States in every age period from 25 to 64 years.

Curiously enough, the mortality rate of the insured group, at all ages combined, is lower than that of males in the registration states, being 11.8 and 13.8 per 1,000 respectively. This is due to lower mortality in the first age group—15 to 24 years—and in the last—65

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

TABLE I

DEATH RATES PER 100,000 FOR ALL CAUSES OF DEATH
AGES 15 YEARS AND OVER
White Males
1923

Years of Age	15 and over	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
United States Registration States	1,384.5	363.8	457.7	717.4	1,207.4	2,527.8	8,304.6
Metropolitan Industrial Dept.	1,183.5	347.2	556.1	946.6	1,725.4	3,385.3	7,574.7
Per Cent Insured of Population Death Rates	85.5	95.4	121.5	131.9	142.9	133.9	91.2

years and over. At age 25, the mortality rate of the insured is already higher and remains so up to age 64, increasing progressively from age 25 to 54 years. In the age period 45 to 54 years, the death rate for the insured exceeds that for the general population group by 43 per cent. In the succeeding age period—55 to 64 years—the rate is 34 per cent higher. These rates reflect the results of industrial exposure. In the beginning, the group of policy holders is in its best physical condition and has a lower mortality rate than the general population. At age 25, the situation changes; and thereafter, largely we believe as a result of industrial hazards, the mortality rate is heavier than that of the general male population. The last age period, where the insured again make a more favorable showing, is not reliable because most of our industrial policies terminate at age 74. It therefore follows that the average age of policy holders in the class 65 years of age and over is lower than that of the corresponding population group; and consequently, other things being equal, one would expect their mortality rate to be lower.

The effects of industry are also clearly revealed in the differential death rates for males and females of the same economic class. Comparing the death rates given in Table II for male policy holders and for their wives and sisters as represented by our female industrial policy holders, we find some striking differences. After age 10, the mortality rates for males are consistently higher than for females, with the single exception of the age period 15 to 24 years. Since the industrialization of women is then at its height, the question of the

TABLE II

DEATH RATES PER 100,000 FOR ALL CAUSES OF DEATH
AGES 10 YEARS AND OVER
METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
1923

Years of Age	10 to 14	15 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
White Males	198.6	347.2	556.1	946.6	1,725.4	3,385.3	7,574.7
White Females	162.4	353.3	491.9	677.9	1,188.0	2,576.1	6,726.7
Per Cent Male of Female	122.3	98.3	113.1	139.6	145.2	131.4	112.6

relative susceptibility of men and of women to the exactions of industry upon their health is definitely raised. After this age, the large majority of these women become housewives, and we notice a much lower rate of mortality for them in each succeeding age period than for men. This, we think, is largely traceable to the absence of industrial hazards in the life of most women.

Even more marked differences suggestive of the effects of industrial exposures are found when the mortality of industrial males is compared with that of persons who are for the most part engaged in non-hazardous pursuits. We may take, for this comparison, white male policy holders insured in the ordinary department of the Metropolitan Life Insurance Company, composed mainly of the clerical, professional, and commercial classes. Agricultural workers and the better paid mechanics are also represented in fairly large numbers. Age for age considered, the mortality rates for the industrial group run from one and one-half times to more than double the rates for those in the ordinary department. This is shown in Table III.

TABLE III

DEATH RATES PER 100,000 BY SPECIFIED AGE GROUPS FOR ALL CAUSES OF DEATH, 1923
REGULAR ORDINARY DEPARTMENT PREMIUM-PAYING BUSINESS (TOTAL MALES)
COMPARED WITH INDUSTRIAL DEPARTMENT PREMIUM-PAYING BUSINESS (WHITE MALES)

Years of Age	20 and over	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 and over
Industrial Males	1,404.1	400.6	556.1	946.6	1,725.4	3,385.3	7,574.7
Ordinary Males	550.0	255.2	268.4	422.0	790.1	1,868.0	5,604.1
Per Cent Industrial of Ordinary	255.3	157.0	207.2	224.3	218.4	181.2	135.2

In terms of life expectation, the severer status of the industrial worker is equally impressive. The industrial worker at age 20, when he begins his career, has an expectation of life of 42 years; or in other words he may expect to reach 62. The 20-year old worker engaged in non-hazardous occupations, however, may expect to attain age 69, or 7 years additional. Industrial workers are at a disadvantage in each succeeding period; at age 30 the difference is 6.6 years, at age 50, 4.2 years, and at age 70, 1.3 years, always in favor of the non-industrial group.

The above comparisons between the death rates of various groups —males insured in the industrial department of the Metropolitan, males of the registration states, males insured in the ordinary branch of the Metropolitan, and females of the wage earning class—show clearly the influence of industrial environment on mortality rates and life expectation. The difference in the mortality rates for these groups gives a rough measure of the tax which industrial work exacts,

and reflects the hazards to which workers are exposed. Other items obviously account for a part of the disparity in these figures. Heredity and innate differences play some part, but probably the most important factors are the conditions incidental to industrial employment including deleterious dusts, excessive fatigue, bad posture, crowded work rooms, dampness, extreme changes of temperature and sometimes specific occupational poisoning, to which industrial workers are so frequently exposed.

The health picture of the industrial worker is, however, far from discouraging when we consider the vast improvement which has taken place in recent years. Between 1912 and 1923 the death rate for our industrial group has declined from 1,621.7 per 100,000 to 1,183.5 per 100,000. Not only has there been a total decline of 27 per cent, but a substantial decline in the death rate has characterized every age group. On account of this reduced mortality, almost 14,000 fewer deaths have occurred among the 3¼ million policy holders in the single year of 1923 than would have taken place had the mortality rates of 1912 prevailed. This amounts in terms of life expectation to an average increase of 5 years for each industrial worker at age 20; and there has been some increase in longevity at every age period. The greatest reduction in mortality has taken place in the important working ages 25 to 34 and 35 to 44, when the rates declined 43.1 and 41.2 per cent respectively. Less progress is recorded after age 55, the decline amounting to only 16.4 per cent in the age period 55 to 64 years.

Turning now to a consideration of the specific diseases causing mortality among our working population, we find that almost every cause of death has shared in the highly gratifying downward trend of mortality.

Tuberculosis of the respiratory system, which in 1912 was the chief cause of death, has shown a very great improvement, the death rate declining from 319.9 per 100,000 in 1912 to 149.7 in 1923, a fall of 53.2 per cent. As a result, tuberculosis is now superseded by heart disease as the leading cause of death. Workers 25 to 34 years of age and 35 to 44 years were the most favorably affected, the decreases amounting to 60.2 and 62.6 per cent respectively. Nephritis has shown a significant though a smaller decrease of 38.0 per cent, the rates declining from 178.1 for all ages in 1912 to 110.5 in 1923. The mortality rate of this disease showed the greatest decline in the 35 to 44 age period where it went down 55.7 per cent. Mortality from pneumonia also showed a substantial reduction of 26 per cent, the rate in 1923 being only 92.5 per 100,000. The younger workers en-

joyed the greatest decline, the reduction amounting to 42.4 and 35.2 per cent respectively in the age periods 25 to 34 and 35 to 44. The fatal accident rate was reduced from 140.6 in 1912 to 121.2 in 1923, a decline of 13.8 per cent. Organic diseases of the heart showed little change at all ages. The death rate declined 7.5 per cent, or from 203.9 per 100,000 to 188.7. In the age period 35 to 44, however, the reduction amounted to 33.5 per cent.

Some of the lesser causes of death display a marked diminution, notably typhoid fever, cirrhosis of the liver and suicide, with decreases of 72.2, 65.4 and 42.2 per cent respectively. The effects of better industrial hygiene are clearly seen in the 50 per cent decline in the death rate from chronic lead poisoning, a disease almost exclusively occupational in origin.

Several exceptions to the general downward trend of mortality are to be noted. Cancer has increased in frequency, the death rate rising from 77.6 per 100,000 in 1912 to 94.9 in 1923, a rise of 22.3 per cent. In the important age periods 45 to 54 and 55 to 64, the rates increased 15.5 per cent and 30.6 per cent respectively. Influenza went up 157 per cent and automobile accidents almost 500 per cent at all ages. Diabetes and homicides registered increases, 13 and 18 per cent respectively for all ages. Cancer, influenza and automobile accidents increased at every age period; diabetes at every period after age 45; and homicides at every period except the 45 to 54 and 55 to 64.

TABLE IV

PER CENT DECLINE IN DEATH RATES AMONG WHITE MALES AND WHITE FEMALES INSURED IN INDUSTRIAL DEPARTMENT AND AMONG WHITE MALES OF THE REGISTRATION STATES OF 1910

	Metropolitan Life Insurance Company 1912 to 1923		Registration States 1911 to 1923
Age Group Years	White Males Per Cent	White Females Per Cent	White Males Per Cent
15 and older	27.0	21.1	3.5
15–24	26.0	21.1	19.3
25–34	43.1	27.5	29.0
35–44	41.2	28.2	23.2
45–54	26.3	17.5	15.7
55–64	16.4	13.7	6.1
65 years and older	13.4	12.1	+ 3.6

Those who are concerned with the health of the working population will be especially interested to observe that the death rate at every age has declined more rapidly for the industrial group than for others.

Table IV shows the percentage of decline in mortality of white males insured in our industrial department as compared with insured

white females and white males of the general population (U. S. Registration States of 1910).

Age for age considered, the decline in the death rates for our insured group has been from 7 to 18 per cent greater than the decline for males of the registration states; and from 1 to 16 per cent greater than for females of the industrial population. The greatest gain for all classes has been at the ages 25 to 34 and 35 to 44 years; and at these ages also the rate of decline for industrial males exceeds by the greatest margin the decline in the rates of the other classes. It would be very instructive if we could make similar comparisons between the trend in the death rates for individual causes of death for males of the registration states and for males insured in our industrial department. Unfortunately, the data necessary are not available. However, our figures, although incomplete, indicate that the decline in mortality among industrial males has been more rapid for all of the more important causes of death. This fact has been conclusively shown for tuberculosis in a recent study[1] on the declining tuberculosis death rate where it is pointed out that the maximum decline in the death rate from tuberculosis among industrial males between the years 1911 and 1925 occurred at the ages between 20 and 45 years and that at these ages the rate of decline was about 20 per cent greater among industrial males than among males in the general population.

It would be of the utmost value to our discussion if it were possible to present the facts for the trend of mortality among men engaged in specific occupations. We should then be able to learn whether all occupations were sharing in the improved conditions; what preventive measures had been productive of the greatest good; and where there was the greatest need for intensive future efforts. Incredible though it may seem, the number of occupations for which we have death rates covering a period of years in the United States is very small and the data do not lend themselves to ready interpretation. We did not have for our study the number of insured in each occupation; and for that reason, we cannot present death rates by occupation. We were, therefore, compelled to use the method of proportionate mortality, that is, to find out for each occupation the part that any cause of death played in the total mortality with due regard to age. While not as sensitive a measure as actual death rates, this method affords a fairly reliable indication of what the actual death rates for each cause would show. It is not feasible to present here the many instructive findings of this analysis. The facts for tuberculosis, however, are outstanding and are of especial interest to industrial hygienists.

Seventy-two occupational classes were investigated. Of these, all but 6 showed a lower percentage of deaths from tuberculosis in the period 1922 to 1924 than in 1911 to 1913. The occupations with the highest proportion of deaths from this cause were, in order: miners, underground—other than coal miners; pottery workers; stone cutters; waiters and hotel servants; cutlers and grinders; cigar makers and tobacco workers; laundry workers; compositors, printers, and pressmen; brass foundry workers; barbers and hair dressers; glass workers; and the clerical workers. There has been a decline in the percentage of deaths from tuberculosis for each of these occupations, except the miners (other than coal miners), since 1911–1913. Data are not available for individual groups of metal miners, such as gold and silver, lead and zinc, iron, etc.; but as a group, metal miners have shown, in more recent years, a higher ratio of deaths from tuberculosis than they did a decade or more ago. The increase is so slight that it is entirely possible that the actual tuberculosis death rate has decreased in this group, also. The apparent higher proportion of deaths from tuberculosis among miners may well be the result of greater reductions for the other major causes of death.

What factors have brought about this vast improvement in the health and longevity of industrial workers? Surely among the many causes must be included the wide expansion of workmen's compensation, preventive industrial medicine, the safety movement, the reduction in the hours of labor, elimination of the sweat-shop, better plant sanitation, the wider education of the workers regarding the dangers inherent in certain occupations, and the more intelligent care now taken to safeguard the health of workers, as contributory to this gratifying result. But even more important has been the improved standard of living which the increased prosperity of the American wage earner has provided. The outlook for the future is bright indeed. There is every reason to believe that the continuation and expansion of health activities in industry, noticeable everywhere, will result in further reductions in mortality. The trend in the death rate according to our recent figures is still downward. It is not unreasonable to expect, therefore, that in the not far distant future the mortality rates of industrial workers will approach, if they do not quite equal, those of the more favored classes of the population.

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Vitamins as Factors in Health and in Food Values II*

IN OUR report of last year,[1] attention was called to the fact that the so-called vitamin B had been shown to be of multiple nature, this one term having covered at least two nutritionally essential substances, one the long recognized antineuritic vitamin, the other more heat-stable and possessing what Goldberger has designated as a pellagra preventing property. While these "anti-disease" properties serve as convenient means of distinguishing the two factors and are, at least in some regions, also of very great intrinsic importance to the public health, yet it is no less important to recognize with equal clearness that both the substances perform essential functions in normal nutrition as well.

So recent is this differentiation of the former vitamin B that many of its phases remain to be worked out, so that their discussion at present would be more or less premature. Even terminology is still under discussion.

Miss Smith[2] has conveniently summarized much of the evidence for the existence of at least two essential factors, and the various designations which have been applied to them; and at our last meeting Dr. Eddy[3] reported quite fully upon certain phases of this interesting development of our knowledge of the vitamins, with special reference to recent progress in the study of the chemistry of the antineuritic substance, and the experimental differentiation of the other factor or factors through the current research work of himself and his associates.

These summaries and discussions are so recent and so readily available that it seems best to forego the traversing of the same ground in this report; but rather to devote the limited space available to the bearings of this new development upon the particular aspect of the matter with which this committee as such is immediately concerned, that is, these vitamins as factors in food values and in health.

In the matter of food values, it is plain that in future we must deal with two (or more) factors in considering that part of our nutritive requirement which in the past has been covered by the one term "vitamin B." How quickly and completely all statements, which in

* Report of the Committee on Nutritional Problems presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

the past have been made in terms of vitamin B, now can and should be dismissed from our minds is a question of judgment and temperament which it is not our present purpose to debate. Much could be said, on the one hand, in favor of the prompt rejection of whatever is contaminated with misconception; and, on the other hand, in favor of conserving the results of the very considerable amount of good work which has already been recorded upon the vitamin B values of foods in so far as this can be done by well reasoned reinterpretation of soundly determined experimental facts.

Whatever position the individual student or teacher of food values may take in this connection, it is certain that references to the vitamin B of the past as a factor in food values cannot be expunged from the literature, and the question of their meaning will continue to be pertinent for some time to come.

Such tests for vitamin B values as have in the past been made by means of the prevention or cure of polyneuritis in pigeons are presumably indications of the antineuritic values of the materials thus tested.

But most workers have felt that the rat growth method yielded more uniform results, and so it has been more generally used in examining foods for vitamin B values. Foods which have been found by this method to have high vitamin B value, as the term has been understood in the past, may now be understood to be valuable sources of both the nutritional essentials now recognized as the antineuritic and antipellagric factors (since both are essential to growth); and such an item in our knowledge of food values seems even more significant now than before.

As both the antineuritic and antipellagric factors are essential to growth, paucity of either one would result in giving a food a low vitamin B value as hitherto tested by the rat growth method. Hence foods which have been reported as of low vitamin B value on the basis of such tests should now be tested quantitatively for each of the two factors separately; for such a food may be relatively richer in one than in the other.

This may also be true in the case of a food which is a good source of both. In fact, cases of outstanding excellence in each of the two directions have already been established. Whole wheat (and doubtless this will be found to be true of other cereals also) has been shown to be especially rich in antineuritic, and milk especially rich in antipellagric value. Each of these important foods is a good source of both factors, yet when eaten together they gain still further in nutritive value through their supplementary relationship to each other.

THE PELLAGRA PROBLEM

A more complicated situation confronts us when we turn to the consideration of the precise relationship of the antipellagric factor (the heat stable nutritional essential of the former vitamin B) to the theoretical and practical problem of the prevention of pellagra. We recognize the appropriateness of the term antipellagric in the sense that this factor undoubtedly tends to prevent the development of pellagra-like symptoms in experimental animals; but it seems probable that other substances (not necessarily closely related to this one in their chemical natures or normal nutritional functions) may also help to keep the body in a pellagra resisting state of health.

In this case more than one factor may be antipellagric, and no one substance may hold the same all-controlling relation to pellagra that the antineuritic substance appears to bear to beriberi.

Much evidence seems to support this view. In the first place, pellagra may not be so purely a deficiency disease as beriberi and scurvy now appear to be.

Jobling and others[4] have presented evidence which, while professedly somewhat tentative, seems much too significant to be ignored, to the effect that there is involved in pellagra an infectious agent which is able to establish itself in the human organism when the latter is malnourished through subsistence upon unbalanced diet.

Such a view of pellagra, as both an infectious and a nutritional disease, would place it in a category similar to that to which sprue is ordinarily assigned.

Tuberculosis is also a disease in which both infection and nutrition are involved, though here still other factors are known to be involved also, and the case *seems* distinctly different because the infectious agent is now well known. It is possible, however, that if we knew both cases better, the comparison of these two diseases might seem much more natural; and McCollum has advanced the idea that the all too frequent shortage of calcium and vitamin A in the diet is a common cause in rendering the body susceptible to either tuberculosis or pellagra, as the case may be.

A perhaps more familiar nutritional theory[5] has associated pellagra (or susceptibility to pellagra) with inadequacy in the kind or amount of food protein, such as to lead to a shortage of one or more of the essential amino acids which the proteins supply; and a few years ago some experimental evidence was reported from England which seemed to link the prevention and cure of pellagra-like conditions with the definite amino acid, tryptophan. So far as we know, this work has neither been confirmed nor explicitly refuted.

Important new evidence, however, now focuses our attention upon other nutritional factors.

The work of Goldberger and his associates[6] of the U. S. Public Health Service, in demonstrating that the heat-stable factor of the former vitamin B has the property of preventing a pellagra-like condition in the rat, has already been mentioned.

Simultaneously, Underhill and Mendel have shown that there is also a fat-soluble substance which prevents the development of a pellagra-like condition in the dog.[7]

In their second and very complete paper, Underhill and Mendel give full accounts of numerous experiments in which butter fat, egg yolk, carrots, or crystallized carotin has prevented or cured the pellagra-like condition of nutritional deficiency disease which Chittenden and Underhill discovered in 1917. We can make no better use of the necessarily limited time and space available for the consideration of this important work of Underhill and Mendel than to quote the summary with which they conclude their paper:

> When butter fat is fed to dogs suffering from the deficiency disease described by Chittenden and Underhill in 1917, these animals are quickly restored to a normal condition and may be maintained in health for prolonged periods.
>
> Under similar circumstances cod liver oil, known to contain active fat-soluble vitamin A, fails to restore these diseased dogs. Evidently this vitamin is not the potent factor in butter fat.
>
> The effective factor in butter fat is apparently quite labile for the potency is diminished by maintaining in cold storage during a period of 9 to 11 months.
>
> The presence of the potent factor in butter fat is associated with the color of the butter. As the color decreases the potency is diminished.
>
> Egg yolk contains the effective factor but is apparently less potent than butter fat.
>
> Boiled unpeeled carrots are even more effective in curative properties than is butter fat.
>
> Lard extracts the potent agent from carrots.
>
> It would appear that there is a direct relationship between the presence of carotinoids in the substances tested and the potent factor.
>
> Crystallized carotin in relatively small doses is capable of curing the diseased condition.
>
> Finally, these experiments lend support to the conception that naturally occurring pigmentary substances in foodstuffs play a rôle in nutritive processes.

This is plainly a factor not previously recognized. Its properties seem so different as to make it unlikely that there is any close relationship between this substance and the water soluble, heat-stable anti-pellagric vitamin of Goldberger. Does this mean that a deficiency of either of these two different and apparently unrelated substances may be the determining factor in pellagra?

It would, in our judgment, be unprofitable to press this question of theoretical interpretation at present, because there are still discrepancies to be cleared up as to the empirical facts regarding prevention of pellagra by different articles of food. Butter and carrots are much more favorably reported from New Haven than from Washington—in fact, regarding carrots, Underhill and Mendel say: "The discrepancies between the results of Goldberger and his associates and our own are so great as to prohibit attempts at explanation." And, on the other hand, the U. S. Public Health Service appears to attribute greater pellagra preventing value to wheat germ than is consistent with the findings of other laboratories.

But dietary means for the practical prevention of pellagra are now well known. In the mill village region of western South Carolina, where pellagra was extremely prevalent a dozen years ago and is now so greatly reduced as to be chiefly a memory, though still a threatening one, everybody, from the best educated to the most unlettered, refers confidently to "balanced diet" as the sovereign remedy and preventive.

Among the somewhat diverse impressions as to particular articles or types of food (for in most cases the diet has been enriched in several ways at once), there is such a general consensus of opinion that dairy products are especially effective, that in parts of the South the Red Cross is reported to be combating pellagra by the lending of cows—an excellent educational device, but not to be taken as meaning that physical proximity of cow and patient is essential, for milk contains the needed factor or factors in sufficiently stable form so that the cow can function at any distance that may be economically convenient.

Unanimity of opinion that milk is of high pellagra preventive value is equally consistent with any of the nutritional theories, because milk contains all the nutritionally essential factors, and is an outstandingly valuable source of nearly all of them.

But, as already suggested, this practical dietary means of combating pellagra is well known. Hence the somewhat confusing and apparently complex situation which confronts us as to the theoretical explanation of pellagra prevention need not retard the actual control of the disease, while the research which is needed for the clearing up of the theoretical problem may well be expected to add to our knowledge of the chemistry of normal nutrition and ultimately contribute to a still fuller understanding of the scientific foundations of positive health.

HENRY C. SHERMAN, *Chairman*

D. B. JONES — E. L. FISK

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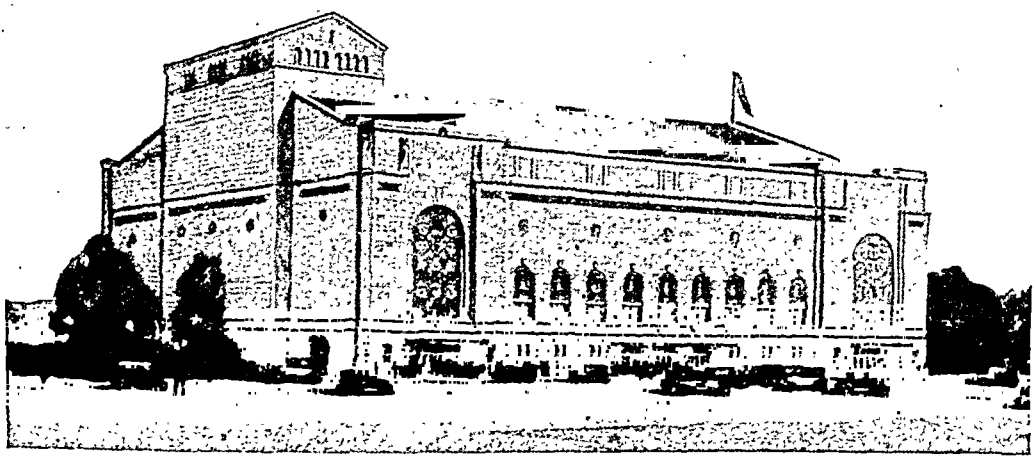
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Sanitary Etiquette

THE U. S. Public Health Service has coined this name, which should come into general use. It carries a significance which everyone will recognize. Coughing and sneezing without protecting the mouth, indiscriminate kissing, insistence upon shaking hands, blowing the nose on a dirty handkerchief used later for some other purpose, and many similar practices which are too common, represent "unhygienic manners." The same is true of moistening various articles such as money, books, tickets, etc., with saliva.

The essence of good manners is consideration for others, and this applies to social customs as to hygiene. The Service suggests the writing of a book, "The Hygiene of Etiquette," and hopes that it will teach prophylactic manners and practical hygiene as well as social courtesy.



MINNEAPOLIS MUNICIPAL AUDITORIUM

Health Education in Illinois Teachers' Colleges*

MARY L. HAHN

Supervisor School Health Education, Division of Child Hygiene, State Department of Public Health, Springfield, Ill.

THE problem of health education in a college for teachers is a triple one, concerned first, with the personal health of the students, second, with the selection of subject matter, and third, with methods in health teaching.

The American Public Health Association poster entitled "Milestones of Public Health" gives the date, 1918, as the beginning of school health education. James F. Rogers, M.D., Chief of the Division of Physical Education and School Hygiene, U. S. Bureau of Education, makes a similar statement.[1] Whether or not we concur in this statement, we do know that since the year 1918 the term "health education" has almost entirely replaced the older one of "physiology" or "physiology and hygiene."

This paper will deal with health education in the Illinois teachers' colleges since the World War and the possibilities for the program of the future. During the post-war period two of the schools each added a physician to their staffs and one a nurse, and all the teachers of physiology placed more emphasis on health habits and methods of health habit training in the elementary school than before.

It was not until 1925, however, that a united effort was made to consider the health programs in the Illinois teachers' colleges and to suggest future policies. A survey of public health service in fifteen Illinois cities[2] was made by the Illinois Department of Public Health, with the guidance of Thomas G. Perrin, M.D., of the U. S. Public Health Service. This survey showed that the public health service in these cities was far from the standard set by the A. P. H. A. *Appraisal Form for City Health Work.* Of a possible 100 per cent of service, only 1 city was receiving as much as 80 per cent, and 6 cities were receiving less than 50 per cent. The survey showed inadequate expenditures for fundamental health services as well as inadequate

* Read before the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

service—both the result of lack of information and appreciation on the part of the community. Education loomed large as the best possible means of stimulating public opinion in relation to these health services.

In order to find efficient educational channels, the advisory committee of the Illinois Department of Public Health in coöperation with representatives from the state teachers' colleges made a study of the health programs in these institutions in an effort to recommend measures for their stimulation and improvement. As a result of the work of this joint committee, a plan was drafted for training student teachers in personal and public health. Later this plan was submitted to and endorsed by the Illinois State Department of Public Health, the Illinois Normal School Board, and the presidents and faculties of the teachers' colleges. The special features of this original plan were: (1) health examinations and professional health service for all students, (2) proper living conditions for all students, (3) a required course in personal and public health, to be known as health education, and (4) additional required health courses for all 4-year students.

This brings us to the question—what are the results of this united effort to meet the present health education problems in the teachers' colleges?

HEALTH EXAMINATIONS

Prior to September, 1926, examinations had been given regularly only in 2 of the colleges where resident physicians were in charge. In the two years since that date all 5 colleges have required their entering students to be examined. Physicians from the State Department of Public Health have assisted several of the colleges in making these examinations, but for the most part the college physicians and local physicians have had this responsibility.

In 1 college which has no staff physician, the resident nurse, cooperating with the physical training department, conducts the examinations with the help of local physicians, dentists, and nurses. In the other 2 colleges the physical training department supervises the examinations. One college has added a nurse to its health service staff, but thus far this is the only one having both a resident physician and a nurse. As yet, 2 of the smaller colleges have neither.

One of the problems in connection with health examinations is that of records and record forms. The desirability of uniform blanks for this purpose has been discussed by the various persons in charge of the examinations, but a form satisfactory for general use in all 5 colleges has not been prepared. Further study is needed on this subject.

The matter of advising students in regard to correctable defects and considering health records in connection with professional ratings is difficult to handle in those colleges which have no resident physician. Much of the value of the examination is lost if time does not permit the physician to consider the findings with the student. Serious deficiencies of eye, ear or throat are usually referred for correction to the family physician, but the minor defects, which are a slow but certain drain on future vitality, are ignored for want of time unless the resident physician or nurse can arrange for a later conference.

The possibility of a student health council for stimulating personal responsibility in this connection has been suggested. Dr. Bailey's plan for a health councillor[3] might also meet this need. A few nurses, some physical training, and some health teachers are well fitted, because of their broad training, to serve as councillors in this field. The failure to have a resident physician or nurse as councillor is fundamentally due to lack of finances. The need of their services for the student group is recognized. The next step consists in recognizing it as of sufficient importance to overcome the financial difficulty.

The health examination prior to graduation will be as general as the entrance health examination only when the college staffs include both the physician and nurse.

The professional health service suggested in the plan included such features as hospital care, visiting nurse service and control of contagion. This last has always received more or less attention in all of the teachers' colleges, but the hospital care and visiting nurse service are of necessity limited because the professional health staff is limited. The time will doubtless come when the prospective student and his guardians will inquire as carefully concerning the health service offered by a school as they now inquire regarding its courses, professors, degrees, and social life. At the present time, however, a study of the catalogs of our 5 Illinois teachers' colleges shows that they give practically no information of this sort.

PROPER LIVING CONDITIONS

Each college has an excellent dormitory, but these house only a comparatively few of the women students. In the past, faculty committees and the deans have given considerable time and thought to the off campus students. The new plan, however, has stimulated new interest in and control of student living conditions. All householders who wish to furnish board or room to students are registered at the college. The houses on the approved list must meet certain requirements regarding heating, lighting, and ventilation, toilet and bath

facilities, screening, size of rooms, and control of communicable diseases. An extensive and excellent study of student housing conditions was recently made in 1 college, and special attention has been given the subject in each of the others. The question of uniform blanks for recording housing conditions has been discussed at the annual meeting of the teachers' college faculties. It should receive further consideration.

HEALTH EDUCATION COURSES

The health education course which was recommended in the plan for the teachers' colleges was the result of the findings in the survey of fifteen Illinois cities,[2] which pointed to the need for more general information regarding public health services.

The 5 teachers' colleges have always offered courses in physiology and sanitation which emphasized to a greater or less degree the problems of personal and public health. The object of the plan in this, as in other respects, was to arouse new interest in this field of education. To this end the new title, "health education," was suggested and this has been generally adopted. This course in health education was recommended as a minimum requirement for all 2-year students, and the teachers' college catalogs show that such is now the case. As a required part of this course the inspection of sanitary conditions within the local college community was suggested, which may include the homes or dormitories, school buildings, eating places, markets, dairies, and local health departments. In connection with the inspection of sanitary school buildings the *School Health Appraisal Form*, sponsored by the Illinois Congress of Parents and Teachers and the Division of Child Hygiene, State Department of Health, will be available during the present school year.

It was further recommended that all students engaged in supervised teaching at the time they are enrolled in the health education course be given a survey assignment in the training school. The report of this survey should include the sanitary care of the classroom and its equipment; the sickness, absence, and contagion rates of the training school pupils; and the health habits taught to the pupils. This part of the plan has not been generally emphasized. The *School Health Appraisal Form* should help to promote this type of inspection since it helps to state standards and also to check results.

A second feature suggested for the health education course is the scoring of the student's own health habits. As yet this feature of the plan has not been extensively used. At least two instructors in this course have had students check their practices in regard to the different health problems, as these are considered in the regular class work.

Usually these personal scores have been unsigned and have not been considered in making the individual's academic record. There has been considerable discussion among health education specialists concerning the grading of personal health-habit scores. If good teaching can develop well balanced appreciation and interest in health practices, it would seem wise to emphasize the personal rather than the academic value of these records. The use of the individual health inventory as reported in other schools seems to indicate that it is most valuable when personally discussed with the faculty adviser or when its use is sponsored by a student organization. The work of arranging a general score card for personal health practices is still before our instructors of health education.

The recommended plan suggested further, that students in the health education classes make a study of the health or hygiene textbooks officially used in the elementary and high schools of Illinois. The aim to train students to discriminate as to the presentation, the pedagogic correctness, and the scientific accuracy of this class of books has been generally included in this course. The instructors in 3 of the colleges have directed their students in making collections of health education books and other materials and evaluating their usefulness. Recently the School Health Education Service of the State Department of Public Health arranged an exhibit of such materials which it loaned to 3 of the colleges during their summer school sessions. This feature of the course can profitably be extended in the future.

Reference books to be supplied by the libraries for students in the health education courses were recommended as to type but not by title. In all of the colleges these have been supplied and for the most part generously. The question of a textbook for the course could not, according to the Illinois law, be decided by the committee. However, certain requirements were stated but thus far no one book has been found which satisfactorily meets them all. Government and other bulletins which deal with personal and public health have been used to overcome this difficulty.

ADDITIONAL REQUIRED HEALTH COURSES

The plan recommended that an advanced health course be required of every student enrolled in a 4-year curriculum. For the most part such advanced courses have been neither offered nor required. A few exceptions occur in connection with the courses in home economics, physical training, and high school methods, which offer home nursing, corrective exercises, and adolescent or mental hy-

giene problems, respectively. Health programs of college rank tend to begin and end with elementary or single term health education courses. Thomas A. Storey, M.D., indicated this in his report, *The Status of Hygiene Programs in Institutions of Higher Education in the United States,*[4] and Emma Dolfinger warned us against this danger in her address given at Atlantic City in 1926.[5] If we are to have adequate health programs in our public schools in the future, we must have superintendents, principals and teachers who are adequately trained in this field.

In Dr. Storey's report he made a very definite plea for developing a civic attitude toward health education, and he deplored the fact that the educational aspect of administrative hygiene programs is almost completely ignored. In the teachers' colleges some first-hand experience with the administrative problems of heating, lighting, water supply, sanitary care of school buildings and control of communicable diseases would certainly be invaluable to prospective superintendents and principals. The fact that reports from 2 of the Illinois teachers' colleges were included in Dr. Storey's study indicates that along with other schools throughout the country we have failed to utilize some of our own best opportunities.

According to the standards set by Dr. Storey's study, we also fail in extensively coördinating the various parts of the health program. This, he claims, must result in more or less duplication of effort and in less effective programs than could be expected from extensive cooperation. The Illinois teachers' colleges are no exception to this claim. An opportunity for considering the value of increasing all health education activities in the teachers' colleges is offered in connection with the annual meeting of the 5 faculties. During the past year a session of their program was devoted to "Health Education Problems in the Teachers' Colleges." The staff members from the departments of health service, biology and hygiene, physical education, and home economics were all present. The interest in the general discussions assured the success of plans for future meetings. It also helped to assure the success of health programs for Illinois teachers' colleges.

SUMMARY

The teachers' colleges in Illinois have been stimulated in their health programs not only by the physical records of World War recruits, but even more effectively by the findings of the survey made in fifteen Illinois cities. The plan for a health program which was recommended to and adopted by the teachers' colleges in 1925 has increased their activities so that (1) health examinations are, at pres-

ent, the rule rather than the exception; (2) efforts to require good living conditions for *all* students and to inspect them regularly have been increased or stimulated; and (3) the health education course required of all students emphasizes the value and the standards for public health service, the requirements for an effective public school health program, and the importance of personal health practices.

An increasingly effective health program in the future probably depends on (1) adding a physician and a nurse to the resident staff of each college where these are not now included; (2) increasing the number of advanced courses in health education and the opportunities for studying the administrative health problems of the training school, especially for prospective superintendents, principals, and special teachers of health instruction; and (3) on continuing the coöperative efforts of the various departments concerned with the health program in the Illinois teachers' colleges.

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Communicability of Pneumonia

IT IS nearly 100 years since Dr. Samuel Henry Dickson, of Charleston, S. C., insisted upon the communicability of pneumonia, some 15 years before Pasteur began his experiments which founded the science of bacteriology.

All physicians of experience have observed instances in which the contagiousness of pneumonia could hardly be questioned. The New York City Department of Health during a 6-months period has studied 8,767 cases of pneumonia of which only 18 were secondary.

In view of the unquestioned fact that many pneumonias are due to specific germs, this small number of cases is rather surprising.

Probably other factors are also concerned, such as increased susceptibility. However, the fact that pneumonia is possibly communicable must not be lost sight of.—*Weekly Bull.*, New York City Dept. of Health, Mar. 9, 1929.

The Correction of Infant Mortality Rates for Residence

DOROTHY G. WIEHL

Division of Research, Milbank Memorial Fund, New York, N. Y.

THE death rate among children under 1 year of age is generally considered peculiarly sensitive to sanitary and other environmental factors. For this reason, infant mortality rates are under constant scrutiny wherever health work is being carried on, and their accuracy is of more than ordinary importance. To persons who are in close touch with the infant mortality statistics for any specific community it is a recognized fact that the officially recorded death rates do not always give a fair representation of local conditions, since the practice of using the number of births in the area as that of the infant population, and of relating to this population all deaths under 1 year of age within the area, without regard for the actual residence of the mother or infant, may result in a death rate which is not typical of the *resident* infant population. There are other inaccuracies in the records of infant mortality; but this paper is to discuss only those due to this reason.

Several conditions, of increasing importance, are involved. The modern trend toward hospitalization of maternity cases is bringing into cities with hospital facilities more and more mothers who are residents of rural communities and villages, with the result that the births recorded do not represent the infant population of the cities, nor of the surrounding districts. Deaths among these non-resident infants are not charged to the locality where the birth was recorded unless the death takes place before removal from the hospital. It might be expected that this would tend to lower the infant death rate in the communities with large numbers of non-resident births and to raise it in those from which these births were drawn. However, this result may be more than offset by other factors: (1) a high death rate in early infancy among the non-resident infants because of a comparatively large proportion of confinements having complications among those seeking hospital care; (2) deaths in the hospitals of non-resident infants brought for treatment after birth, thereby removing them from the locality to which the death should be ascribed and adding them to another. Obviously, to obtain an infant death rate which is repre-

sentative of a specific community, the two factors, births and deaths under 1 year of age, must be so refined that they apply to this community and also have a true relationship one to the other.

For an urban locality with good hospital facilities, the exclusion of births to non-resident mothers and of deaths of all non-resident infants will usually give a satisfactory resident rate, since the numbers of resident births or deaths which occur away from such a city are too few to materially affect any total rate. But for a rural community whose residents must seek hospital care in the nearest or most accessible cities, it becomes necessary to determine the number of births to resident mothers and also the deaths of resident infants which were registered in other places. The former method of refinement, the exclusion of non-residents, is relatively easy, but the search for births and deaths belonging to a specific community among those registered in many other communities is both time consuming and expensive. So far as is known to the writer, no study of infant mortality in a rural area has been published in which the death rate has been refined both by the exclusion of non-resident births and infant deaths and by the allocation to the area of resident births and deaths recorded elsewhere.

For Cattaraugus County, N. Y., such a refinement of the infant death rate for residence was undertaken and the results are here presented. The county has been coöperating in a rural health demonstration since 1923. It is in the southwestern corner of New York and had a population of about 73,816 in 1925, of which approximately 60 per cent was rural. The largest city is Olean (population 21,345), near Pennsylvania to the south and Allegany County to the east. The hospitals in Olean serve many residents of Pennsylvania and of Allegany County as well as those of Cattaraugus County. Salamanca (population 9,978), with one small hospital, provides care for a certain number of nearby rural residents. Residents of the northern and western parts of the county find Buffalo and Jamestown much more accessible than Olean, and some in the southern districts go to Bradford, Pa. Clearly, the problem of determining the death rate among resident infants in Cattaraugus is a dual one—not only must non-residents be excluded but the resident births and infant deaths in other areas must be considered. In this respect Cattaraugus County is in no way unique, as arbitrary political boundaries are meaningless so far as delimiting an integrated community.

In this study the recorded infant mortality rates are compared with two corrected rates: (1) that obtained by the method of excluding non-residents in the years 1921 to 1927, and (2) that obtained by allocation to the county of births and deaths under 1 year of age

TABLE I

NUMBER OF BIRTHS RECORDED IN CATTARAUGUS COUNTY AND IN THE URBAN AND RURAL SECTIONS COMPARED WITH THE NUMBER TO RESIDENT MOTHERS

Year	Total County			Urban			Rural		
	Total Number Recorded	Births in County to Resident Mothers	Total Resident Births*	Total Number Recorded	Births in County to Resident Mothers†	Total Resident Births*	Total Number Recorded	Births in County to Resident Mothers†	Total Resident Births*
1921	1,652	1,588	—	831	733	—	821	855	—
1922	1,578	1,535	—	773	675	—	805	860	—
1923	1,442	1,396	—	728	636	—	714	760	—
1924	1,474	1,412	—	762	645	—	712	767	—
1925	1,425	1,355	1,412	781	637	649	644	718	763
1926	1,417	1,318	1,374	816	633	643	601	685	731
1927	1,424	1,314	1,357	817	625	630	607	689	727

* Includes births to resident mothers recorded in adjoining areas.

† Number of recorded births to mothers not residents of the county were deducted and all births in the county allocated according to the place of usual residence of the mother.

which were registered outside, in addition to excluding non-residents, in the years 1925, 1926 and 1927. By the first method are excluded not only the non-resident births and deaths under 1 year but also the deaths of resident infants whose births were registered outside the county. The result is a death rate among resident infants born in the county. By the second method only non-residents are excluded and those resident infants born outside are added to the population together with deaths among this group which occurred elsewhere than in Cattaraugus County, the result being a death rate for the total infant population of Cattaraugus County. The first rate has the advantage of being easily derived from the data on the birth and death certificates registered in the county, while the second is more accurate, being free from the possible effect of excluding a selected group of infants.

The importance of making these refinements according to residence is considered in relation to the effect upon (1) the total infant death rate for the county, (2) the death rate from specific causes for the county, (3) the total death rate for the urban and rural parts of the county, and (4) the death rate from specific causes for the urban and rural parts of the county.

Only the areas adjoining Cattaraugus County have been considered as likely to have been the birthplace of any considerable number of Cattaraugus infants. These include Chautauqua, Erie, Wyoming and Allegany Counties, N. Y., and Bradford, Pa., to the south as shown in Figure I. All birth certificates from each of these

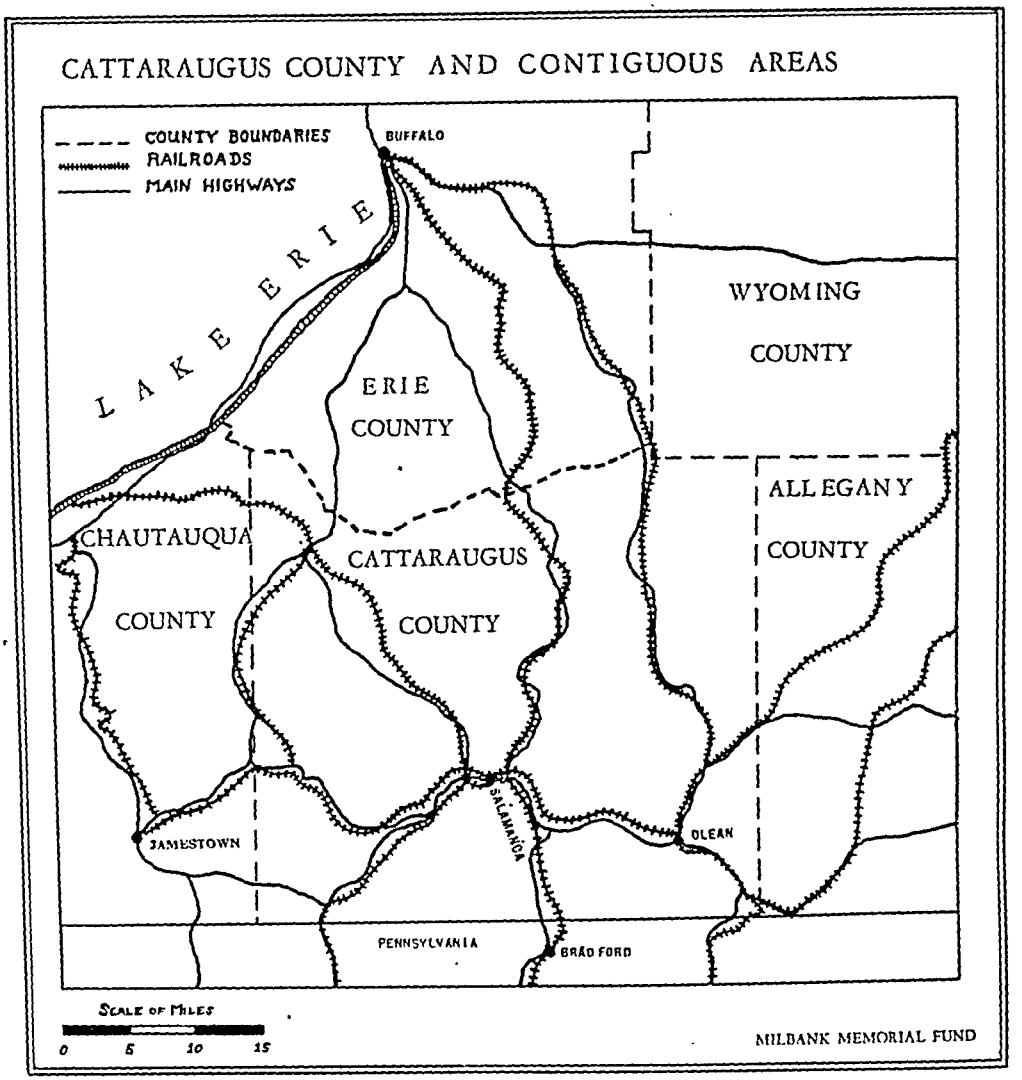


FIGURE I—Map showing accessibility by railways and highways of Cattaraugus County to neighboring cities and of neighboring rural districts to Cattaraugus County cities.

counties in 1925, 1926 and 1927,* filed with the State Registrar of Vital Statistics, were examined to find any births to mothers who were residents of Cattaraugus County, and the number of births to Cattaraugus County mothers recorded in Bradford, Pa., were obtained from the registrar of that city. The number of births recorded in Cattaraugus County, the number after excluding births to non-resident

* This part of the study was limited to 3 years because of the time involved. Approximately 19,000 birth certificates were scanned for residence of mother for each year.

TABLE II

RECORDED AND RESIDENT DEATHS UNDER ONE YEAR OF AGE FOR CATTARAUGUS COUNTY, 1921–1927

Year	Total Recorded in Co.	Non-resident Deaths Recorded in County		Recorded Deaths of Residents Born outside Co.*	Deaths among Residents Born in County	Deaths outside Co. among Res. Born outside	Net Resident Deaths
		Born in County	Born outside County				
1921	129	7	0	3	119	?	—
1922	145	2	2	4	137	?	—
1923	130	1	4	2	123	?	—
1924	97	4	2	3	88	?	—
1925	102	2	3	0	97	2	99
1926	95	7	1	2	85	1	88
1927	86	8	3	3	72	1	76

* Decedent has been counted as a resident unless information available definitely established the residence as outside the county at the time of death.

mothers, and the total number of resident births after adding those found in the adjoining areas are shown in Table I.*

The number of deaths under 1 year of age registered in the county is shown in Table II. The non-resident deaths and those of resident infants born outside the county, and not counted in the population under 1 year of age, are also given. Difficulty was experienced in classifying a few infants born outside the county from the data on the death certificate, but they have been counted as residents unless the information established the residence as outside the county at the time of death.† To obtain the mortality among the births to resident mothers which occurred outside the county, the names of the infants registered in adjoining counties of New York were checked against the index of all deaths reported to the State Department of Health. No check on the mortality among the births which occurred in Bradford, Pa. (8 or 9 annually), was made. Only 2 deaths in 1925, 1 in 1926 and 1 in 1927 were found to have occurred among these infants before they returned to Cattaraugus County.‡

On the basis of the data in Tables I and II, it is possible to compute the two corrected rates for the county; i.e., the death rate among

* See Downes, Jean. The Accuracy of the Recorded Birth Rates in Urban and Rural Areas, *J. Am. Stat. Assn.*, Mar., 1929, for further details as to the allocation of births and the effect on the birth rate.

† This practice was followed because these deaths occurred apparently from conditions contracted in the county and to balance any deaths outside the county of resident infants who changed their residence during the first year of life.

‡ As the total births to resident mothers in 1925, 1926 and 1927 registered in adjoining New York counties numbered 140, the 4 deaths among this group would give approximately the death rate in the first week of life among residents born in the county, which varied from 3 to 4 per 100 in the years 1921 to 1927.

TABLE III

INFANT MORTALITY RATE AS RECORDED IN CATTARAUGUS COUNTY COMPARED WITH THE MORTALITY RATE AMONG RESIDENT INFANTS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births			Percentage Difference from Recorded Rate	
	Recorded	Residents Born in County	Total Known Residents	Residents Born in County	Total Residents
1921	78.1	74.9	—	−4.1	—
1922	91.9	89.3	—	−2.8	—
1923	90.2	88.1	—	−2.3	—
1924	65.8	62.5	—	−5.3	—
1925	71.5	71.6	70.1	+0.1	−2.0
1926	67.0	64.5	64.0	−3.7	−4.5
1927	60.4	54.8	56.0	−9.3	−7.3

resident infants born in the county and for all known resident births. These are compared in Table III with the annual rates based on the registered births and deaths.

From 1921 to 1927, the resident death rate for infants born in the county was lower than the gross registered rate in every year except 1925. The difference is not great, 5 per cent or less in every year but 1927 when it was 9 per cent, but the influence of the non-resident mortality has been consistently unfavorable to the Cattaraugus County rate. In 1927, exclusion of non-residents lowers the rate enough to increase materially the indicated decline over the 1926 infant mortality, and is important because it suggests an increasing effect of the non-residents on the county rate.

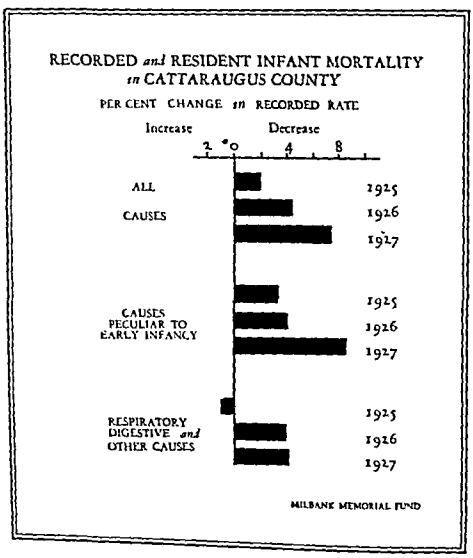


FIGURE II—The percentage change in the infant mortality rates officially recorded in Cattaraugus County resulting from correction for residence in 1925, 1926 and 1927.

The total resident death rate for children under 1 year of age also was lower than the crude registered rate for each of the years 1925, 1926 and 1927. The percentage difference between these and the recorded rate is shown in Figure II. The total resident rate differed scarcely at all from the death rate obtained for the residents born in the county in 1926; was a little lower in 1925; and a little higher in

1927. The infants born away from the county were less than 5 per cent of the total births to residents, and since the mortality among them was not high, the inclusion of these and the deaths among them does not affect the resident death rate so much as the exclusion of the non-resident births and deaths affects the registered rate.

A high mortality among the non-resident births in the county during the first few days of life is suggested by the fact that a reduction in the death rate results when the non-resident births and deaths are excluded. The mortality during the first week of life * among the non-resident births is compared in Table IV with the mortality among

TABLE IV

DEATH RATE IN THE FIRST WEEK OF LIFE AMONG NON-RESIDENT INFANTS BORN AT OLEAN COMPARED WITH THE RATE FOR RESIDENTS OF CATTARAUGUS COUNTY BORN IN THE COUNTY, 1921–1927

Year	Residents Born in County			Non-residents Born at Olean		
	Number of Live Births	Deaths under One Week	Rate per 1,000	Number of Live Births	Deaths under One Week	Rate per 1,000
1921	1,588	57	35.9	43	7*	162.8
1922	1,535	59	38.4	31	2	64.7
1923	1,396	63	45.1	36	1	27.8
1924	1,412	50	35.4	51	3	58.8
1925	1,355	57	42.1	57	2	35.1
1926	1,318	47	35.6	86	5	58.2
1927	1,314	38	28.9	94	8	85.1
1921–27	9,918	371	37.4	398	28	70.4

* Including two infants dying on the 8th day.

the resident births. Since all the non-resident deaths occurred at Olean, the rates have been computed on non-resident births in Olean. Although the mortality among the non-resident births fluctuated widely from year to year, it is clear that the death rate in the first week of life was higher than that among resident births, the average for the 7 years being nearly twice as high. This higher death rate in early infancy among the non-resident births is explained by the fact that they are a selected group which includes a large proportion of maternity cases for which some complication of confinement was expected.

The deaths which occurred among the non-resident births before removal from the county resulted for the most part from premature

* Few deaths occurred among the non-resident births after the first week; in 1921, 2 infants died at the age of 8 days; in 1924, 1 died at the age of 16 days; and in 1926, 1 died at 16 days and one at 11 months, the latter infant obviously having been brought to the hospital a second time for treatment.

birth, injury at birth or some congenital cause. It is to be expected that their exclusion will have a greater effect on the death rates from these specific causes than on the total infant mortality rate. The infant death rate from the general group of " early infancy " causes as registered in the county is compared in Table V with the rate for the resident infants born in the county and for the total known resident infant population. From 1925 to 1927, the " early infancy " mortality among all resident infants was lower than the registered rate, and the difference increased from 3.3 per cent in 1925, to 8.5 per cent in 1927, as is shown in Figure II.

The " early infancy " mortality rate for resident infants born in the county was also lower than the recorded rate. It differed only slightly from the total resident rate, and, being available back to 1921, it further indicates that non-resident deaths have had an increasing effect on the recorded mortality from " early infancy " causes.

The corrected infant death rates from all causes other than those " peculiar to early infancy " also are compared with the registered rates in Table V. These deaths are due chiefly to communicable, respiratory and gastrointestinal diseases. As deaths from these causes rarely occur in the first few weeks of life, and no death was reported

TABLE V

RECORDED AND RESIDENT INFANT MORTALITY BY TWO BROAD GROUPS OF CAUSES IN CATTARAUGUS COUNTY AND PERCENTAGE CHANGE IN RESIDENT RATE FROM RECORDED RATE, 1921–1927

Year	Malformations, Premature Birth and All Other Causes Peculiar to Early Infancy			Respiratory, Gastrointestinal, Communicable Diseases and All Other Causes		
	Recorded	Residents Born in County	Total Resident Infants	Recorded	Residents Born in County	Total Resident Infants
	Deaths under One Year per 1,000 Live Births					
1921	43.0	40.9	—	35.1	34.0	35.2
1922	53.9	54.1	—	38.0	35.2	36.8
1923	49.9	50.1	—	40.2	38.0	38.3
1924	43.4	41.8	—	22.4	20.5	21.2
1925	49.1	48.0	47.5	22.5	23.6	22.7
1926	49.4	48.6	47.3	17.6	15.9	16.9
1927	43.5	38.9	39.8	16.9	16.0	16.2
	Percentage Change over Recorded Rate					
1921	—	− 4.9	—	—	−3.1	+0.3
1922	—	+ 0.4	—	—	−7.4	−3.2
1923	—	+ 0.4	—	—	−5.5	−4.7
1924	—	− 3.7	—	—	−8.5	−5.4
1925	—	− 2.2	−3.3	—	+4.9	+0.9
1926	—	− 1.6	−4.3	—	−9.7	−4.0
1927	—	−10.6	−8.5	—	−5.3	−4.1

among the resident births outside the county for the years 1925 to 1927 before the child had returned to Cattaraugus County, the total resident deaths recorded in the county have been related to the total births to resident mothers 1921 to 1927, the number of births to resident mothers occurring outside the county 1921 to 1924 having been estimated. The total resident mortality from respiratory, digestive and other causes exclusive of those classified as " early in-

TABLE VI

NUMBER OF DEATHS UNDER ONE YEAR OF AGE REGISTERED IN URBAN CATTARAUGUS COUNTY AND NUMBER THAT WERE RESIDENTS OF URBAN AREA, 1921–1927

Year	Number Registered in Olean and Salamanca					
	Total	Non-residents of Urban Area		Net Number of Residents*	Decedents Born outside of County	Deaths among Residents Born in County
		And of County	But Residents of County			
1921	69	7	7	55	2	53
1922	73	3	7	63	1	62
1923	71	5	4	62	0	62
1924	48	6	3	39	1	38
1925	62	5	7	50	0	50
1926	61	8	3	50	1	49
1927	50	11	3	36	1	35

* No deaths of urban residents were registered in rural districts. One death occurred in New York State outside the county in 1925, none in 1926 or 1927.

fancy " is lower than the registered rate in 5 of the 7 years, the difference varying from 0.7 to 1.9 deaths per 1,000, with a maximum decrease of 5 per cent. The total resident rate is slightly higher than the rate for residents born in the county in 6 of the 7 years; so the difference between the recorded and the resident rates obtained by the exclusion of non-residents is somewhat greater than the difference between the recorded and the total resident rates.

Although in these years the difference between the two resident rates is not marked, the rate for the total resident infants is the more truly representative. In obtaining the death rate among infants born in the county, the deaths of certain *resident* infants whose births occurred outside the county must be excluded although conditions leading to these are chargeable to the county. This exclusion has proportionately smaller effect on the rate for broad groups of causes than on the rate for a single cause. Thus, there may have been 5 deaths from diarrhea, one of which was a resident infant born in Buffalo; the exclusion of this death will reduce the mortality rate for this cause nearly 20 per cent since the population base differs only slightly for

TABLE VII

NUMBER OF DEATHS UNDER ONE YEAR OF AGE REGISTERED IN RURAL CATTARAUGUS COUNTY AND NUMBER THAT WERE RESIDENTS OF RURAL AREA, 1921–1927

Year	Number of Deaths of Rural Residents					
	Registered in Rural County*	Registered in Urban County	Registered outside of County	Total Known Deaths	Decedent Born outside of County	Deaths among Infants Born in County
1921	60	7	—	—	1	66
1922	71	7	—	—	3	75
1923	59	4	—	—	2	61
1924	49	3	—	—	2	50
1925	40	7	1	48	0	47
1926	34	3	1	38	1	36
1927	36	3	1	40	2	37

* Excludes one non-resident death in 1922.

the two rates. On the other hand, if several years are grouped when dealing with the mortality from a single cause, so that 1 death will not be so large a part of the total, the rate for residents born in the county would give a close approximation to the total resident rate.

Obviously the true infant death rate for urban and rural parts of the county is to be obtained by allocating the births and deaths re-

TABLE VIII

RECORDED AND RESIDENT INFANT MORTALITY RATES IN URBAN AND RURAL CATTARAUGUS COUNTY, 1921–1927

Year	Deaths under One Year per 1,000 Live Births			Percentage Change over Recorded Rate	
	Recorded	Among Residents Born in County	Among Total Known Births	Rate among Residents Born in County	Rate for Total Known Residents
			Urban		
1921	83.0	72.3	—	−12.9	—
1922	94.4	91.9	—	− 2.6	—
1923	97.5	97.5	—	0.0	—
1924	63.0	58.9	—	− 6.5	—
1925	79.4	78.5	78.6	− 1.1	−1.0
1926	74.8	77.4	77.8	+ 3.4	+4.0
1927	61.2	56.0	57.1	− 8.5	−6.7
			Rural		
1921	73.1	77.2	—	+ 5.6	—
1922	89.4	87.2	—	− 2.5	—
1923	82.6	80.3	—	− 2.8	—
1924	68.8	65.2	—	− 5.2	—
1925	62.1	65.5	62.9	+ 5.5	+1.3
1926	56.6	52.6	52.0	− 7.1	−8.1
1927	59.3	53.7	55.0	− 9.4	−7.3

TABLE IX

INFANT MORTALITY RECORDED IN URBAN LOCALITIES OF CATTARAUGUS COUNTY BY TWO GROUPS OF CAUSES COMPARED WITH MORTALITY AMONG RESIDENTS BORN IN THE COUNTY AND WITH MORTALITY AMONG TOTAL KNOWN BIRTHS TO RESIDENT MOTHERS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births from Specified Causes					
	Congenital Malformations, Premature Birth Injury and Other Early Infancy Causes			Communicable, Respiratory, Gastrointestinal Diseases and Other Causes		
	As Registered	Residents Born in County	Total Known Residents*	As Registered	Residents Born in County	Total Known Residents†
1921	40.9	30.0	—	42.1	42.3	44.7
1922	54.3	51.9	—	40.1	40.0	41.1
1923	57.7	56.6	—	39.8	40.9	40.3
1924	42.0	38.8	—	21.0	20.2	21.4
1925	57.6	54.9	55.5	21.8	23.6	23.1
1926	53.9	56.9	56.0	20.8	20.5	21.8
1927	41.6	35.2	34.9	19.6	20.8	22.2
	Percentage Increase or Decrease in Rate due to Correction for Residence					
1921	—	−26.7	—	—	+0.5	+ 6.2
1922	—	− 4.4	—	—	−0.2	+ 2.5
1923	—	− 1.9	—	—	+2.8	+ 1.3
1924	—	− 7.6	—	—	−3.8	+ 1.9
1925	—	− 4.7	− 3.6	—	+8.3	+ 6.0
1926	—	+ 5.6	+ 3.9	—	−1.4	+ 4.8
1927	—	−15.4	−16.1	—	+6.1	+13.3

* Deaths outside the county of resident infants unknown 1921–1924.

† Deaths outside the county from causes other than "early infancy" would be rare and are offset by deaths in the county of infants who became residents sometime after birth.

corded in the county to the place of usual residence of the mother, in addition to adding those resident births and deaths recorded in outside districts. The number of deaths of children under 1 year of age registered in urban and rural Cattaraugus 1921 to 1927 is shown in Tables VI and VII, together with the number to be deducted or added, to obtain the net number of deaths among the resident population under 1 year of age.* Two resident totals are shown for each area; one being the number after allocating the deaths of resident infants born in the county and deducting those born outside the county, as well as the non-resident deaths; the other being the total number of known resident deaths after allocating all deaths registered in the county and those known to have occurred outside. The rates obtained when these totals are related to their respective populations are shown in Table VIII.

* The population under 1 year of age, i.e., births to residents of urban and rural Cattaraugus County after allocating to usual residence, is given in Table I.

The infant death rate, both urban and rural, is lowered in most of the 7 years when based on either the net number of deaths among the resident population under 1 year of age born in the county, or the total, including those born outside the county, instead of on the number of deaths and births recorded in the urban or rural districts. The difference between the two resident rates is very slight in nearly every year. The per cent that the corrected rates are above or below the registered rates is indicated in Table VIII. The lower resident rate in the urban section is explained by the relatively high death rate in the first week of life among the births to non-residents of the urban districts, and to the deaths among non-resident infants brought to Olean for hospital care; but the lower resident rate in the rural section results from a marked increase in the population under 1 year of age when all births to rural mothers have been allocated to that section. Since both rates are reduced, the relative infant mortality

TABLE X

INFANT MORTALITY REGISTERED IN RURAL DISTRICTS OF CATTARAUGUS COUNTY BY TWO GROUPS OF CAUSES COMPARED WITH MORTALITY AMONG RESIDENTS BORN IN THE COUNTY AND WITH MORTALITY AMONG TOTAL KNOWN BIRTHS TO RESIDENT MOTHERS, 1921–1927

Year	Deaths under One Year per 1,000 Live Births from Specified Causes					
	Congenital Malformations, Premature Birth Injury and Other Early Infancy Causes			Communicable, Respiratory, Gastrointestinal Diseases and Other Causes		
	As Registered	Residents Born in County	Total Known Residents*	As Registered	Residents Born in County	Total Known Residents†
1921	45.1	50.3	—	28.0	26.9	27.2
1922	53.4	55.8	—	36.0	31.4	33.6
1923	42.0	44.7	—	40.6	35.5	38.2
1924	44.9	44.3	—	23.9	20.9	21.1
1925	38.8	41.8	40.6	23.3	23.7	22.3
1926	43.3	40.9	39.7	13.3	11.7	12.3
1927	46.1	42.1	44.0	13.2	11.6	11.0
	Percentage Increase or Decrease in Rate due to Correction for Residence					
1921	—	+11.5	—	—	− 3.9	− 2.9
1922	—	+ 4.5	—	—	−12.8	− 6.7
1923	—	+ 6.4	—	—	−12.6	− 5.9
1924	—	− 1.3	—	—	−12.6	−11.7
1925	—	+ 7.7	+4.6	—	+ 1.7	− 5.9
1926	—	− 5.5	−8.3	—	−12.0	− 7.5
1927	—	− 8.7	−4.6	—	−12.1	−16.7

* Deaths outside the county of resident infants unknown 1921–1924.

† Deaths outside the county from causes other than "early infancy" would be rare and are offset by deaths in the county of infants who became residents sometime after birth.

from all causes in the two areas is not materially changed except in 1921 and 1926.

From year to year, the effect on the infant mortality rate of allocating all births and deaths in the first year of life to their place of usual residence varies widely for both urban and rural rates. No estimate of the probable effect of this factor in one year could be based on the known experience in another year. There is, however, a fairly definite indication that the trend is toward a widening difference between the uncorrected and the corrected rate for both.

In Table IX, the infant death rates in Olean and Salamanca, and in Table X the rates for the rural district have been classified as those "peculiar to early infancy" and all other causes, chiefly respiratory, gastrointestinal and communicable diseases. The rates based on the registered births and deaths in each year from 1921 to 1927 are compared with the two series of rates for resident infants.

The effect of correction for non-residents on the urban mortality from "early infancy" conditions varies widely for these 7 years, ranging from a decrease of 27 per cent in 1921 to an increase of 5.6 per cent in 1926 when residents born in the county are considered. Again the total differs only slightly from the incomplete resident rate. For the rural part of the county, the death rate from "early infancy" causes in the earlier years was increased by the reallocation of the births and deaths of rural residents recorded in urban localities, but in most recent years the rate is reduced. A maximum increase by correction for residence of 11.5 per cent is indicated in 1921 and a maximum decrease of 8.7 per cent in 1927. Since the annual rates as well as the effect of correction show wide annual fluctuations, the following comparison of the corrected and uncorrected rates for the most recent 3 years with the previous 3-year period in each area is of interest:

DEATHS FROM "EARLY INFANCY" CAUSES PER 1,000 LIVE BIRTHS IN CATTARAUGUS COUNTY

Period	Recorded Rate	Rate among Residents		Per cent Change	
		Born in Co.	Total	Res. Born in Co.	Total
Urban					
1922–1924	51.26	49.08	—	−4.2	—
1925–1927	50.95	49.08	48.91	−3.7	−4.0
Rural					
1922–1924	47.07	48.60	—	+3.3	—
1925–1927	42.66	41.59	41.42	−2.5	−2.9

The corrected resident rates for the urban and rural parts of the county bring out more definitely than the officially recorded rate two

interesting indications: (1) the mortality from "early infancy" in the two areas was almost identical in the earlier 3-year period; (2) the rural rate declined 15 per cent in the later 3-year period compared with 10 per cent shown by the recorded rates.

The total resident urban death rates from respiratory, gastro-intestinal and communicable diseases are from 1 to 13 per cent higher than the registered rates, and the difference is more marked in the total resident rate than in that for residents born in the county. The opposite is true of the rural death rates, from these causes: For the rural section the rates are lower after correction for residence, and

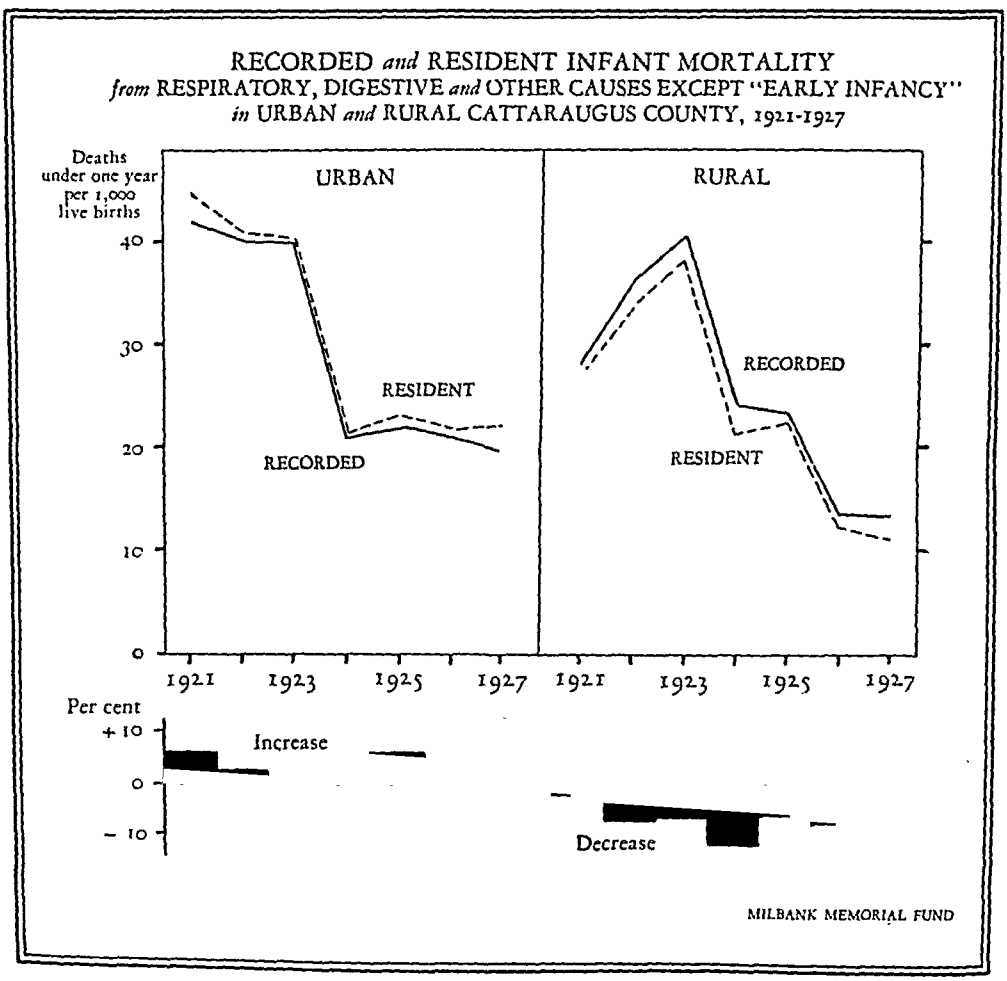


FIGURE III—Infant mortality rates from all causes except "early infancy" in urban and rural Cattaraugus County as officially recorded compared with the resident rates and the percentage change resulting from correction for residence, 1921–1927.

the total resident rate shows less difference in most years than the rate for residents born in the county. Since the urban rate is increased by correction for residence, and the rural rate is lowered, the divergence in the rates for the two areas is widened, as shown in Figure III. The corrected rural mortality from communicable, respiratory and gastrointestinal diseases is lower than the urban in every year, whereas the registered rates were higher in 3 of the 7 years, and in the other the difference between the two is widened.

SUMMARY

It seems essential that the infant mortality rates should be corrected for residence if an accurate picture of the changes in the death rates from year to year or of the comparative mortality from specific causes in different areas is to be obtained. In Cattaraugus County, the officially recorded infant mortality from all causes for 1927 was 15 per cent lower than the 1925 rate, while the resident rate showed a decrease of 20 per cent; the recorded death rate from causes peculiar to early infancy was 11 per cent lower in 1927 than in 1925, but the corrected resident rate was 16 per cent lower in 1927 than in 1925. Thus, the inclusion of non-residents reduces the decline in the death rate indicated for recent years.

If the infant mortality rates in urban and rural sections are compared, the results are very unreliable unless corrected for residence.

The difference between the death rates for resident infants born within the county and the rates after reallocation to the county of resident births and deaths occurring outside the county is not striking in 1925, 1926 and 1927, for which both are available. Since the total resident rate is sometimes higher and sometimes lower than the rate obtained after excluding all non-residents and the group of infants born outside the county, differences between mortality from specific causes or in different areas may be either widened or lessened by using the former rate instead of the latter. The total resident rate, being more accurate, is to be preferred, but the use of the rate for residents born in the county yields fairly good results unless a single year's rate or a single cause of death is selected for close scrutiny. In using rates for residents born within the county, it would be necessary, however, to check these against a total resident rate from time to time because hospitalization is still increasing, and because the opening of a hospital in some nearby city, or provision of hospital facilities within a rural area may bring about a change.

Although Cattaraugus County is a small area, the difficulties encountered in attempting to study its infant mortality records in con-

siderable detail are typical of those to be found in the average county. The fact that there has been a health demonstration in this county since 1923 may have brought about a more rapid increase in hospitalization of maternity cases than has occurred in other rural counties but the trend toward hospitalization is general. Few, if any, counties will be so situated that the rural populations will be served entirely by hospitals within the county limits or that the hospitals will not be used by non-residents. Correction of rural rates for residence is more difficult than of the rates for an urban community well supplied locally with hospital facilities, because in the latter case the exclusion of non-residents will usually be sufficient and the information is available at the local registrar's office. For a rural area, for which it is necessary to trace the resident births which occur in outside hospitals and determine the deaths among them, a corrected resident rate is very difficult to obtain. This is a serious handicap in the analysis of rural infant mortality, and of other rural death rates. The publication of resident data by the central bureaus (state and federal) would be of great assistance to persons interested in following the mortality experience of a specific community.

ACKNOWLEDGMENTS—Acknowledgments are made to the Cattaraugus County Health Department, especially to Frances King, Statistician, for assistance in compiling the data, and to the Bureau of Vital Statistics, the New York State Department of Health, for access to the certificates.

New Booklet on the Care of the Baby

UNDER the title, "Your Baby's Care," Dr. Susan P. Souther of the Children's Bureau of the U. S. Department of Commerce has prepared an interesting 32-page booklet on the hygiene of the child under 2 years of age. This booklet has the approval of the Medical Advisory Committee of the American Child Health Association and a Committee of the State and Provincial Health Authorities of North America. It is attractively printed in readable type with interesting illustrations. To add to its usefulness as a textbook for the mother of the young child, the booklet includes an index and a table of contents. This newest publication on child health is offered free to health officials and social agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Mass. Sample copies may be obtained at any time after April 25.

Beverages*

RELIABLE estimates indicate that 12 billion bottles of soft drinks will have been consumed in the United States in the year 1928, an increase of 1 billion bottles over 1927. In addition, stands and stores selling orange and other fruit drinks may be found in almost every city business block. Not only has the beverage industry greatly increased sales, but real progress is being made in using natural fruit beverages, chocolated milk products, etc., in place of artificially colored and flavored and sometimes artificially sweetened drinks.

A review of the literature shows an almost total lack of activity in the health aspects of beverages. While some research work has been done by the fellowship established at one of our state colleges by beverage manufacturers, it has been mostly along commercial lines. It would seem as though public health officials were not interested in beverages or foods, until an epidemic occurred. This apparent inactivity is not confined to research, but is evident in legislation for the control of the industry.

The secretary of a group closely allied to beverage production recently issued instructions for the labeling of artificial raspberry soda. To be legal in all states, eleven different forms of declarations of color and flavor were required. There is almost as great variation in bacterial and chemical standards.

Some states have recently enacted laws that should make for better control of the soft drink industry. Michigan's law requiring the registration of all beverages provides that the registration fee shall go toward the maintenance of a fund for the inspection and control of the beverage industry. Indiana's water law requires that beverages meet a certain standard bacterial count as well as the usual colon standard.

In Chicago, stands are operated in almost every block of the business district, selling orange drinks—some natural fruit, and others entirely artificial. In May, 1926, sanitary control was inaugurated, requiring the taking of weekly samples for bacteriological examination. Orange beverages were required to comply with the standard for drinking water on interstate carriers. During 1926, 542 samples were examined, of which 166, or 30 per cent, showed the presence of colon bacilli. In 1927, 1,375 samples were examined, and 10 per cent

* Report of the Committee presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

were colon positive. In May, 1928, a survey revealed that some orange drinks contained as much as 20 per cent fruit juice, others as little as 2½ per cent, while still others were wholly artificial; yet with the aid of flavoring extracts and colors, all looked the same to the consumer.

In view of present knowledge as to the value of the vitamin and mineral elements in fruit juices, Chicago officials hold that control of the amount of fruit juice in an orange beverage is just as important, from a public health standpoint, as the control of butterfat in milk. Regulations promulgated June 23, 1928, require:

1. Fresh fruit orange drinks must contain 10 per cent orange juice. Artificial drinks must be sold as such and patrons advised of the contents.
2. Employes submit specimens of feces and urine for typhoid examination.
3. If orange peel is used in the manufacture of beverages, the oranges must be subjected to a chlorine bath sufficient to disinfect the exterior.

While orange drinks have been the common beverage in Chicago, fruit juices such as pineapple, lemon, and grape are popularly used in other cities, and an investigation will probably reveal conditions similar to those found in Chicago previous to the adoption of these regulations.

COMMITTEE RECOMMENDATIONS

It is recommended that the membership of the Committee on Beverages be increased to 6 and that this committee be divided into 3 sub-committees, each having a definite, prescribed program along the following lines:

1. A study of methods of manufacture of beverages, and machinery used, with the object of developing types of machinery that may be easily cleaned and safe to use.[1] Levine states that with some types of filters water has a higher bacterial count after filtration than before.
2. A study of methods of inspection and legislation, with the object of developing a uniform method of inspection and control; the sub-committee on this subject to have as its goal the production of a standard beverage law or ordinance similar to Frank's standard milk ordinance.
3. A study of foreign substances now used in beverages such as saccharin, saponin and preservatives, with the object of determining their usefulness in beverages and their harmful effects on man.

T. J. KING
MAURICE J. DOOLING

REFERENCE

1. *Am. Food J.*, 22: 19–20, 1927.

Steps in Planning a Health Education and Publicity Program*

Why Have a Plan?

MARY SWAIN ROUTZAHN

Russell Sage Foundation, New York, N. Y.

SUPPOSE that you had time to plan health education and publicity a year ahead. Suppose you were to go about it as though it were an engineering problem, not an odd job for spare moments. How would you analyze the steps in your year's program? Would you, perhaps, begin by setting down your objectives? It is not likely that you keep a card file of possible objectives from which two or three could be selected at random. How then, does one decide what are to be the goals for a given year, say, 1929? How are the best methods of reaching them determined?

These questions are not intended to bring forth broad and impressive statements of purpose, but real, practical, working plans. Each of the papers here presented discusses one essential factor in this kind of planning. No exact formulas are offered; we start with two propositions which we believe to be sound:

1. Advance preparation of a carefully thought out program is essential to good work in health education and publicity.

2. The basis for program making is a study of one's situation so as to determine not only what sort of a response should be sought from the public, but also what is the best procedure in trying to get that response.

Both the selection of goals and the steps to be taken in arriving at a program for reaching them are discussed in the group of articles which follow.

In order to obtain examples of publicity programs for discussion, a request was sent to health departments and health organizations to submit outlines of their plans for the year ahead or for a given project. It was suggested that the outline should answer these questions:

1. Why will you undertake what you are planning? What facts or circumstances or desires lead to the choice of activities?

2. What results are sought? What are the objectives of the responses hoped for?

* Papers from a symposium of the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17 and 18, 1928. Papers by C.-E. A. Winslow, Dr.P.H., and Franklin Fearing, Ph.D., will be published in the June JOURNAL.

3. To whom will you address the messages? What groups or kinds of people will you try to reach as being most important in getting the results wanted?

4. What is to be the message—the chief talking points—in each special activity?

5. How will you approach the selected groups or kinds of people? What do you believe to be their attitude toward the subject, and their understanding or lack of understanding of the subject? What motives, such as fear, the desire for good looks, civic pride, etc., will be appealed to in seeking action?

6. What are to be the methods and materials used in handling the several situations? List what you will do and what forms of publicity you will use.

In addition to the above please list the routine activities, such as day-by-day news which does not relate definitely to the program of effort for the year, the bulletin or house organ, giving out printed matter or information on request, etc.

7. Supplementing the above it will be useful to make up a calendar showing what is to be done month by month in both the preparation and carrying out of the publicity activities.

About 30 programs were received in response to the request. A few of these gave definite and clear-cut answers to the whole list of questions. Some of them gave lists of methods to be employed together with brief mention of the topics to be emphasized. One publicity calendar told what schedule would be followed month by month as suggested in question 7.

The starting point in mapping out a program is naturally its objectives. For our present purposes, we may assume that objective means the response desired from the persons addressed. In most instances the expected response takes the form of readiness to act in certain ways immediately or when the occasion arises. An analysis of the circumstances likely to influence the action of those to whom publicity is addressed is an important factor in the choice of objectives.

For example, a program of education in personal hygiene directed toward persuading city dwellers with small incomes to follow a proper diet, sleep with the windows open, dress to suit the weather, stay out of crowds, exercise daily, take enough rest, and avoid worry, brings the planner face to face with a number of social situations closely bound up with the ability of the average citizen to act on such advice. One must consider the price of eggs, the architecture of homes and offices, fashions in clothing, the transportation problem in cities, modern family life with its restraints, responsibilities and frictions for the individual member, the tremendous urge to acquire debts through instalment buying, and the continuous uncertainty of employment.

In planning health education, shall we leave these questions alone or try to adjust our advice to the persons who are thus handicapped? Shall we even take a hand in changing the conditions? In the present discussion fortunately we do not need to decide which course to fol-

low. We need only to observe that an effort to plan health education so it will be acted upon, instead of merely giving it out in a " take it or leave it " manner, sometimes brings us face to face with problems which it is more comfortable to ignore.

In contrast to the complexities of an educational program directed toward daily habits of living, the diphtheria campaign illustrates a fairly simple situation, in which to decide what we wish people to do, who are the persons to reach, what method of approach will influence them to action, and so on. The audience is easily identified; the thing to be done can be described simply and clearly; and it is reasonable to look forward to completing the whole task in a few years. Here analysis yields results in sound and workable programs.

The next step is to select and identify the persons to whom publicity is directed. This question is closely bound up with objectives. For example, the objective may be to persuade *parents* to see that the child's birth is registered, or *citizens* to vote " yes " on a bond issue.

Another factor in the health education program is the selection of the subject matter. Some of us solve this problem of selecting the message by telling all we know; others of us tell what is uppermost in our minds.

Some understanding of the mental attitudes of persons to be approached in matters of health conduct is important to every phase of a health education program, from the picture on the cover page of a folder to the signature of a letter. Principles of attention, interest and motivation must form the basis of the plan of approach to a particular public.

The forms of expression and the channels through which information from health organizations goes to the public should be adapted to the audiences and the subject matter. In considering the publicity methods to be used in a given situation, we are too often prone to follow the path of least resistance, to select methods which are immediately feasible due to the special ability of some member of the staff or to some special opening made possible by a contact with an interested newspaper or a friendly service club.

Ten years ago the writer listed 60 forms of publicity available for working up attendance at an exhibition. That was before the days of radio, talking pictures, air mail delivery, animated cartoons and other recent inventions for rapid, wide and graphic expression of facts and ideas. With such a wide range of methods to choose from, the planner who states that he expects " to use every available avenue for reaching the public " places himself under the suspicion of having no plan at all, or, at least, no appreciation of the wide range of choice open

to him, and of the importance of selecting wisely the methods to use under any given circumstances. Discussion of this essential part of planning, namely the selection of appropriate forms of publicity, is omitted from this symposium, since it is rather fully treated in easily available books and articles.

The preparation of a calendar or schedule has also been omitted from the discussion. In planning the year's work such a schedule naturally divides itself into: (1) routine publicity, such as publication of a bulletin, release of current news to the newspapers, responding to requests for printed matter, and the like; (2) special projects relating to the season of the year or having some other element of timeliness; and (3) emergency or " opportunist " publicity which seizes upon an unexpected situation, like an epidemic, as an occasion for a special educational campaign.

Emergency events cannot, of course, be scheduled; but the program as a whole may be made flexible enough to allow for substitution of publicity on unexpected events or situations when the occasion arises.

In practice, health education is often considered not as a distinct project but as an incidental part of the work of conducting clinics, nursing service, or administrative work. It is carried out by health officers or executive secretaries who combine it with other duties. The procedure here outlined recognizes the close relationship between publicity and service or administrative work, but considers it as a separate unit of work with a technic and objectives of its own. This fact needs to be kept in mind throughout the series of papers which follow in order to avoid confusion.

Objectives of Publicity—On What Basis Are They Selected?

HOWARD WHIPPLE GREEN, FELLOW A. P. H. A.

Secretary, Cleveland Health Council, Cleveland, O.

SUCCESSFUL health programs have definite objectives. The reason for the program may be a high death rate, a high infant mortality rate, a high diphtheria case or death rate, a high tuberculosis death rate, increasing cancer or heart disease mortality, or extensive sickness. When the facts are once established a further statistical analysis must be made in order to obtain a definite idea of the particular cause of the difficulty. The reason for its existence must be sought.

Let us, for example, consider means for the further reduction of infant mortality. The infant mortality rate has decreased considerably during the past two decades. The death rate of infants in Cleveland in 1910 was 147 per 1,000 births; 2,033 deaths occurred. The rate in 1927 was 59; 1,133 deaths occurred. The much larger number of births occurring in 1927 than in 1910 is reflected in these rates.

The first question would probably be "What causes these deaths?" We find that 790, or 39 per cent, in 1910 were caused by diarrhea and enteritis, and 252, or 12 per cent, by premature birth. In 1927, 99, or 10 per cent, were caused by diarrhea and enteritis and 353, or 34 per cent, by premature birth. The deaths due to diarrhea and enteritis have decreased greatly, and fairly regularly each year. A considerably further decrease is not possible. Even though no deaths due to diarrhea and enteritis occurred, the infant mortality rate could only decrease from 56 to 51.

What is the significance of this fact? Simply this—if, as in Cleveland, the deaths due to diarrhea and enteritis under 1 year have approached an irreducible minimum, attention must be directed to other important causes of infant deaths. The next most important cause is premature birth. It is also evident that the percentage due to prematurity has increased, although the rate is about the same in 1927 as in 1910, namely, 18 per 1,000 infants born alive. However, the largest number of infants in 1927 died because they were prematurely born. An extension of the program already demonstrated to be so effective in reducing the deaths due to diarrhea and enteritis is not indicated because this program has had no effect in reducing the deaths due to premature birth.

No demonstrable effect—why? The greater number of deaths due to diarrhea and enteritis occurs in the last 7 months of the first year of life. The greatest number of deaths due to premature birth occurs during the first 7 days of life, 60 per cent in the first day, and 88 per cent in the first week. It is evident, therefore, that what is done to prevent deaths from this cause after the infant arrives is of little avail because the infant is with us for so short a time. Therefore attention must be directed to the period before birth, and to the institution of prenatal work.

We have found our audience and have defined our fundamental problem. Our basic objective is to reduce deaths due to premature birth. Our audience is the expectant mother. We must now search for the cause of deaths due to premature birth and arrange our publicity to interest our audience and eliminate the causes.

We can emphasize the nutrition necessary for the mother in order

to build sound teeth and good bones for the expected baby. We must interest the pregnant woman in giving birth to a baby free from syphilis. We may even attempt to interest her in mental hygiene. But as yet we have not the stimulus to get our audience and allow us to dispense our instruction, until we remember the layette. What preparation is necessary for the new baby? What clothes are needed? How shall these be made? Now that we have the stimulus, we can push forward the publicity with an assurance of results, because human interest has been aroused.

The tuberculosis death rate is decreasing slowly but surely. For white males between 15 and 25 years of age in Cleveland it decreased 52 per cent in 12 years, but for white females between 15 and 25 years of age only 14 per cent. There we have the fact basis established. The problem is before us—what is the solution?

We make our suppositions, we use our scientific imagination, and to what avail? We have a definite objective for our publicity program—our audience defined!

We decide that girls must be interested more in their health than in their boyish form and their social whirl. But health by itself is of no interest to the modern young lady. Interest her in health as it relates to vitality, good looks, attractiveness, personality, success, and it becomes of first importance.

Contacts with girls of the age we wish to reach may be made most readily through the school teacher, club leader, Sunday School teacher, employment manager, or leaders of girl scout, camp fire, and girl reserve groups. Convincing the leaders of these groups of the importance of health is the first and most important step. Furnishing them with material with which to interest the girls is no less important, but much easier. Finally, placing interesting material directly in the hands of the girls at frequent intervals clinches the program.

DISTRICT PROBLEMS

Statistical analysis indicates the relative importance of our various programs.

We may wish to defeat a chiropractic licensing bill. Our analysis shows many of our voters to be antagonistic to physicians. They consider physicians perhaps as members of a medical trust. Why then should they, as poor voters, strengthen this trust? The objective is definite. The emphasis must be shifted to that of showing the physician as protecting the public health rather than allowing argument to arise between physician and charlatan. The campaign must have as its objective the defense of the public health and interest not only

doctors but dentists, druggists, employment managers, and allied groups.

Antagonism breeds antagonism, but a promotion program for the public good can unite under its banners every individual and organization with this as an objective.

Publicity connected with social work, especially in other fields than public health, has been chiefly concerned with the raising of money rather than the correction of existing faulty basic conditions. The chief reason for publicity methods having been confined to this one field has been a lack of definite statistical data relative to the community, and particularly to various sections of the community. Studies of the composition of the population of large cities and of the particular ills from which it is suffering have been made at various times and in various places. However, the minute analyses of various sections are imperative as a basis for any attempt to alter faulty conditions. Such analyses are being undertaken in Cleveland, using the fundamental data collected by the United States Government each 10 years relative to the populations of small areas of constant geographical boundaries, known as census tracts, or sanitary districts. Social data of all kinds are being collected relative to each census tract. These include the births, causes of death, causes of sickness, the chronically ill, crippled children, dispensary cases, cases cared for by family case work organizations, mothers' pensions, juvenile courts, visits made by the visiting nurse, illegitimate births, houses of prostitution, and so on.

In regard to census tracts, the following points are significant: One may have only 10 persons per acre, another 141 per acre; one may have a population with 40 per cent of the adults illiterate, i.e., unable to write any language; in another 50 per cent of the population may be under 15 years of age, in still another, only 4 per cent. The people living in certain census tracts seem to come to more grief than those in others. A tract in which the family welfare case rate, the tuberculosis death rate, the infant mortality rate, and the rate of juvenile court cases are high, in which houses of prostitution are numerous, in which rents are low and housing conditions bad, merits the attention of any publicity person.

The causes of the conditions must first be sought, the objectives of the publicity determined, the audience called to attention. Then and only then may reform be basic and improvements permanent.

The objectives of the publicity must be based on facts determined with scientific accuracy, and when determined, the audience to be reached is defined, and the methods to be employed may be fixed with some degree of exactness.

Audiences--How to Select and Classify Them

MARJORIE DELAVAN, FELLOW A. P. H. A.
Michigan Department of Health, Lansing, Mich.

JUST as the objectives of a health education and publicity program are determined by a thoughtful and unprejudiced analysis of existing conditions, so are the audiences to be approached defined by the objectives. The term "audiences" in this sense is not limited to those who listen to lectures, but includes everyone who can be reached by any of the publicity avenues at our command.

Audiences are always, in one way or another, selected. They are naturally and automatically selected by the objective chosen. They may then be further and more arbitrarily limited on the basis of available finances, personnel, or time. Our newspaper stories, posters and exhibits carry on their own selective process by the material that they present. Since selection is inevitable, we can agree that it may well be made a conscious and reasoned proceeding in view of its importance to the success of the campaign.

The first step in choosing our audiences is to decide what individuals and groups are directly and indirectly concerned in the attainment of our objective. We have become so thoroughly organized that we think in terms of groups. The organized group is tangible, it has a president who can be convinced, a well defined and counted membership, and a regular meeting day. In some types of campaigns, such as teaching personal hygiene to school children, dependence on the organized group is a safe solution. When time and funds are limited it is often the only one, but with adult groups, where belonging is a matter of choice, it is usually incomplete because the very person we wish most to reach may not be enrolled. Valuable and temptingly convenient as it is, it can never take the place of the individual approach whenever the latter is feasible.

Covering the organized groups of a community, a feat which we are prone to view with satisfaction, is not equivalent to reaching the whole audience. In any publicity campaign it is well to burn a little midnight oil in considering the person who does not belong to clubs.

Going back to the mechanics of the selective process, the audience of primary importance is made up of the individuals upon whose direct action rests the attainment of the objective. In Mr. Green's illustration this person was the prospective mother. In a diphtheria protection program it is the father and mother of the diphtheria-age child. In periodic health examination campaigns it is the adult who comes

within the age group threatened by the degenerative diseases. In a vaccination campaign it is the unvaccinated—or un-revaccinated—person. In a bond issue for a safe municipal water supply the voter who drinks the water is the individual most intimately and directly concerned, the one whose action we wish to stimulate.

Having chosen the individuals who make up this primary audience in any campaign, the next step is to map out their convenient group affiliations. In what organized groups can we find them? Does the prospective mother belong to clubs? Are the fathers and mothers of diphtheria-age children members of any groups? If we can honestly answer "yes," then the solution is enormously simplified. Unfortunately, we often have to answer "no," especially when it comes to prospective mothers and mothers of preschool children. Here the individual approach may be the only inclusive method.

By the individual approach I mean direct contact with the individuals making up the primary audience, with no reliance upon intermediate agencies. For instance, in the campaigns for the promotion of breast feeding that are being carried on by the Bureau of Child Hygiene and Public Health Nursing of the Michigan Department of Health, the path to the mother is direct. The nurse gets from the county clerk the names of parents of babies under 6 months, or under 1 year if a more thorough canvass can be made. She then visits those mothers. In this case the message is delivered directly to the primary audience, and to every member of it.

A variation of this method can be illustrated by the preparation for preschool clinics. A plan of carefully districted home calls can be delegated to a group, such as a mothers' club or a parent-teacher association. This is simply utilizing a group in the individual approach.

Having selected our primary audience and mapped out its group affiliations, the next step is to determine the agencies, individuals or groups that are not personally concerned in the objective but are necessary to the setting of the stage—for after all, most of our health campaigns need stage setting. There is no object in creating a desire for action unless there is a reasonably easy outlet. And to limit our selection of audiences to those that are provided with that outlet is hopelessly to limit our campaign.

There is no point in urging parents to take their children to a physician for toxin-antitoxin in a school where half of the parents cannot afford the treatments, or in a community where there is only one elderly physician and he does not take any stock in new-fangled notions. No particular gain is made when we urge regular medical care during pregnancy, and our prospective mothers live in the plains coun-

try far from a doctor. When we select our audiences we should take care that we either choose those that have the facilities for action at their command, or that we provide such facilities.

The groups and individuals to whom we appeal in this matter of providing the necessary background for action we can term our subsidiary audience. In our diphtheria prevention campaigns we enlist the physicians so that the technical side may be cared for. If the campaign is to be a community venture, with the treatments free to all children, we appeal to the groups who direct or at least influence the expenditure of public funds. We ask the support of the school authorities so that our clinics may be held in the schoolhouse and announced through school channels. We reach the groups who furnish the leadership in public sentiment.

These assisting audiences may or may not include the members of our primary audience. They are chosen on the basis of community leadership rather than immediate contact with the objective. In terming them subsidiary audiences and mentioning them last, I do not in the least minimize their value. They are often the first audience to be approached, and the deciding factor in making possible the whole campaign.

When we have selected our primary audience, found out its affiliations, and chosen our assisting agencies, we have a reasonably clear picture of our composite audience. We are struck at once by the overlapping. I have talked of groups as though they were neat pigeonholes for people, and as though people stayed in their pigeonholes, which is, of course, not true. With our present maze of organizations there is bound to be overlapping, and it is wasteful only when it is duplication. If our material is carefully sifted and prepared, it will reinforce itself by being presented from different angles. Overlapping is not necessarily a drawback in the choosing of audiences.

SUMMARY

The audiences in any publicity campaign are defined automatically by the objectives of the campaign, and limited arbitrarily by the director.

The primary audience is made up of the individuals directly involved, considered as individuals or as groups.

The subsidiary audience consists of the assisting individuals and groups, chosen on the basis of civic leadership.

A thoughtful selection of our audiences, and limitation, in the interest of thoroughness and permanence, aid tremendously in the success of the campaign.

Volatile Solvents Used in Industry*

THE danger to workers in the application of coatings to surfaces of all kinds must be considered under two heads: the character of the coating, and the method of application.

The term " lacquer " is technically applied to a coating which has nitrocellulose as its most important constituent. The solvent is an ester, amyl, butyl or ethyl acetate; and the thinner an aromatic, benzol, toluol or xylol. Castor oil or some other oil may be added as a plasticizer. Normal butyl acetate, with some normal butyl alcohol, is the solvent chiefly used, amyl acetate being more expensive, ethyl acetate less efficient. It is not really necessary to add benzol or any aromatic, but it is cheaper since butyl acetate costs about $1.25 as compared with $.30 for toluol and $.20 for benzol. These last act as solvents as well as thinners up to a certain point, beyond which they begin to precipitate the nitrocellulose. The term " varnish " is technically restricted to a coating made by dissolving a natural gum or resin in a mixture of oil and hydrocarbon.

Next to lead, the most important toxic substance used in coatings is benzol, and here a great improvement has occurred during recent years, due largely to the work of the Benzol Committee of the National Safety Council which, in its final report, laid stress on the danger of even small quantities of benzol in the air of workshops, and urged manufacturers and master painters to substitute toluol, xylol, or the petroleum distillates. This recommendation has been followed by many industrialists, and the use of benzol in coatings is more and more restricted each year. It is still to be found in some lacquers used for spraying because of its volatility. Brush lacquer calls for solvents less volatile than spray lacquer because brush work does not require such quick drying. Indeed, if it dries too quickly, edges and streaks appear. According to one expert, toluol and butyl acetate make a better solvent for spray lacquer than benzol, because the latter evaporates too fast and causes " blushing."

It is certain that in the painting of electrical or agricultural machinery, and in many automobile factories, benzol is no longer used. Varnish and paint removers still contain benzol, but in these as in penetrating stains efforts are being made to find a substitute. In

* Report of the Committee on Volatile Solvents, presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

protective coatings, little benzol is used except in fabrikoid and patent leather. In roofing compounds and tar paints, tar oil is now used.

Fabrikoid, artificial leather, or textile leather, is made by spreading over fabric a nitrocellulose coating containing benzol, sometimes in large quantity (as high as 60 per cent, according to L. Greenburg). Patent leather manufacture is similar except that the coating is spread on skins and hides. In these two industries, benzol still holds its place as solvent and thinner because it evaporates more quickly than toluol. The coating may be spread by a machine similar to that used in the manufacture of spread rubber goods, or applied with a stiff brush, or pressed into the surface with a broad knife. In this hand work, the men must bend over the skin or fabric, and it is hard to see how exhausts could be so placed as to protect them, for it is difficult to provide even window ventilation without setting up drafts which might deposit dust on the coating and spoil it. This is especially true of patent leather, where the slightest blemish shows.

Hunter and Hanflig, 1927, published reports of 6 cases of severe chronic benzol poisoning, 2 of which were contracted in making patent leather.

In making sanitary cans benzol-rubber sealing compound is being replaced by rubber latex. Other occupations in which latex is displacing benzol-rubber are: making cord fabric for tires; cementing shoes, both rubber and leather; and making dipped rubber and spread rubber goods.

Toluol is displacing benzol in nitrocellulose coatings and lacquers, while naphtha, or the less volatile petroleum distillate "Stoddard's Solvent," has largely displaced it in dry cleaning. Several state organizations of the painters' union have carried on successful agitation against the use of benzol in quick-drying paints and other coatings.

Benzol is still generally used for coating patent leather, and sometimes artificial leather; sealing bottles; fastening rubber heels on leather soles; tire building; and as a constituent of paint and varnish removers; but it is believed by insurance men and by many industrialists that in these processes also substitutes will eventually be found.

Wood alcohol is not used as a solvent except as a constituent of denatured alcohol. The formulas for denatured alcohol permitted by the U. S. Treasury Department were revised in February, 1928. The one most largely used for coatings of all kinds is Specially Denatured Formula No. 1, 5 gallons of wood alcohol to every 100 of ethyl alcohol. Other permitted formulas used for varnishes, japans, lacquer thinners and lacquer solvents, are No. 2A, which has 2 gallons of wood alcohol and 2 of benzol to 100 of ethyl alcohol; and No. 23A,

with 10 gallons of acetone and 2 of benzol to 100 of ethyl alcohol. Denatured alcohol, therefore, as used in the coating industry, contains only a small proportion of wood alcohol.

In the study made by the German Association for Industrial Hygiene, several less familiar solvents are mentioned as being used in nitrocellulose coatings. The less volatile but more toxic cyclohexanol acetate may take the place of butyl acetate, and the place of a ketone, usually acetone, may be taken by carbon tetrachloride, chloroform, tetrachlorethane, or trichlorethylene. These solvents are of little or no importance in the United States. Trichlorethylene is not used in coatings such as paint and varnish; tetrachlorethane is not important because cellulose acetate, for which it is the best solvent, is too expensive, and our lacquers are made with nitrocellulose. Chloroform is not used in coatings in this country, and carbon tetrachloride very little. The solvents chiefly used in the United States are normal butyl alcohol and the acetates, amyl, ethyl, and normal butyl. Among new American solvents are ethyl oxybutyrate and the methyl ester of ethylene glycol known by the trade name " cellosolve " and referred to in the 1928 *Chemical Engineering Catalog* as ethylene glycol monoethyl ether. Both of these are advertised as non-toxic, but master painters report that men using them complain of dry throat, feeling of tightness in the chest, and " dopiness."

The Pennsylvania survey, under the direction of Henry Field Smyth, M.D., made some preliminary toxicity tests on guinea pigs by exposing them in Yant and Frey gassing jars to the vapors of two of the above solvents, and the authors have since made similar tests with all of the others, except benzol, that were reported as present in 5 or more lacquers in the Pennsylvania questionnaire, as well as on one type of turpentine, a solvent sometimes found in the newer, less rapidly drying brushing lacquers. They also included distillates obtained from a spraying and a brushing lacquer, both containing less than 0.5 per cent of benzol.

Keyes divides the usual fluid components of lacquers into four groups, based primarily on their boiling ranges:

1. Low boilers, boiling below 100° C., with benzol as the type. In this group are found, among others, ethyl acetate and ethyl alcohol. They usually comprise 10 to 25 per cent of the liquid portion of spraying lacquers.

2. Medium boilers, boiling near 125° C., including toluol, amyl acetate, butyl alcohol and turpentine. They usually comprise 20 to 45 per cent of spraying lacquer liquid.

3. High boilers, boiling from 150° to 200° C., including xylol. High flash naphtha or heavy gasoline would come in this group. They usually comprise 4 to 10 per cent of spraying lacquers, but would form a larger percentage of brushing lacquers.

4. Plasticizers, boiling above 200° C., and not included in the above list, as they are non-volatile at ordinary temperatures and are used in small amounts only. Therefore, they are not a potential menace to the sprayer as ordinarily used.

In applying the coatings, the use of the spray gun has increased and seems destined to keep on increasing. It is said to be wasteful of paint but more than makes up for this by the saving of labor and the speed. The painter still clings to brush work for varnish and to a certain extent for paint, but lacquers are universally applied by spraying, and are displacing both paint and varnish. A large proportion of paint is also applied by spraying. For automobiles, electrical machinery, railway cars and agricultural machinery, spraying has supplanted dipping and brush work. This means a greater hazard to the painter, but this has been compensated for in part. The paint now used is more often than not lead free; the dangerous work of dry rubbing down lead paint has almost disappeared in all but high grade interior work; the devices for protecting the operator are improving as the construction and forced ventilation of spraying booths and the pressure in the spray gun and its construction improve. The pressure is now sometimes as low as 20 pounds, whereas 60, 80, and even 100 pounds were general formerly.

Pouring the paint or flowing it from a hose is in use in some large shops manufacturing electrical equipment. It is, on the whole, the method least attended with risk to the operator, since he stands at a distance and does not come in contact with the paint at all, nor does he need to be protected against pollution of the air from atomized paint.

ALICE HAMILTON, *Chairman*
ELIZABETH B. BRICKER
HENRY FIELD SMYTH

DISCUSSION

P. W. Gumaer, Barrett Company, New York, N. Y.—In reference to the use of benzol it must be pointed out that substitutes such as toluol often cannot be used, since it is a by-product of coal tar distillation produced in small amounts only. The producers are fully alive to the health hazards, and are going far to educate in the safe usage of such substances. Do we know what benzol poisoning is? I am not a physician, but does a low white cell count always mean benzol poisoning? If I am not mistaken there are a number of other conditions unassociated with benzol which may show a low white count. As with lead poisoning, we must have standard diagnostic methods before we can control this hazard and the public concern about it. It is my special province in the company with which I am connected to develop safe procedures for the use of this indispensable product, benzol.

Tentative Record Forms for School Health Work*

School Health Record Form 2

THE form here presented is designed for schools which have medical personnel available for the examination work. This differs from Form 1,† which is for schools having no medical assistance.

Form 2 is designed to bring together in a simple and compact manner those facts about the health of the child which the school can use most advantageously in the child's interest.

Four main groups of facts are called for; namely, (1) communicable diseases and certain other important ailments experienced, (2) immunization record, (3) record of physical examination, and (4) record of absences by cause.

The facts on communicable diseases are of value in guiding administrative action when such diseases are prevalent and it is important to know which children are susceptible and which are immune. The facts on immunization supplement the above record. The physical examination record is needed to assist the school in understanding the child and in guiding his educational program intelligently. The absence record likewise is necessary to a proper understanding of the child. These facts are not ordinarily called for and they constitute a new feature on the school health record. They are inserted here because they are believed to be a potential source of valuable information which has hitherto been greatly neglected.

One difficulty in preparing such a chart is that it presumes certain uniformity in procedure. With varying laws, regulations, organization and personnel, it is quite impossible to devise a single procedure that is best for all places. The committee recommends this card as it stands, conscious that certain adaptations may be necessary to meet differing local situations.

The card shown here is a standard 5″ x 8″ card, Index Bristol, with the entire record on one side. The reverse side can be used for the

* Report of the Sub-Committee on Record Forms (prepared by George T. Palmer, and recommended for experimental use), presented to the Committee on Administrative Practice of the American Public Health Association at its meeting, May 22, 1928.

† Form 1 was published as the pamphlet *Record Forms for Public Health Work*, September, 1927, American Public Health Association, 370 Seventh Avenue, New York, N. Y.

continuous educational record, the local form for which may be printed thereon, or the reverse side may be used for important supplementary notations. It is not intended that the reverse side shall carry the detailed records of home visits by the nurse. This card is to be kept with the teacher, notations on it being made by teacher, nurse and by or for the physician.

Space is provided for the recording of the routine examination findings in terms of a code shown on the card, at three periods during the school life of the child. Preferably these three periods would be the first grade, fifth grade and just before the age when a child is permitted to leave school and secure working papers.

While, from administrative considerations, more than three examinations during elementary school life are not recommended as a routine for all children, it is of course understood that special examinations at more frequent intervals may be quite necessary for certain children.

In mapping out the medical inspection program, time for these special examinations should be taken into account. The routine inspections should not be permitted to take up all available time. Quality of school medical work as well as its utility in the administration of the educational program must not be made to suffer merely for the sake of greater volume.

The value of the medical inspection is at least three-fold: to make available to the educational authorities facts to assist them in planning a course of instruction best adapted to the capabilities of the child; to serve as a demonstration to the parents of the value and utility of professional medical opinion; and, as an outcome of this, to assist the child early in life in eliminating physical defects which may seriously impede his learning and living efficiency. For these reasons it is recommended that every effort be made to secure the attendance of one or both parents at the examination, particularly that made while the child is in the first grade.

One other point should be emphasized. The physician by his training and experience possesses a superior knowledge of anatomy and physiology, and symptomatology of health and departures from health. Consequently his judgment should be utilized to maximum advantage. His time should be conserved and he should be freed from any routine procedures which can be handled with equal satisfaction by one less experienced. Whenever possible the nurse should assist and lighten the physician's burden. The routine inspection of vision and hearing in so far as it is meant to reveal outstanding deficiencies is a matter that is capable of being reduced to a mechanical procedure, the results of which are just as informing under practical

school conditions when carried out under the physician's supervision by nurse or teacher as if done by the physician himself. Doubtful or special cases may very properly be referred to the physician. It is also an economical step to spare the physician the labor of recording his findings on the card. This might better be done by a clerk or, if this is not feasible, by the nurse.

Success in correctly marking the various items called for in the inspection and in securing the alleviation of defects depends so largely on the proper synchronizing of interests of physician, nurse, teacher and parent, that the association of these individuals should be a definite goal on the part of the school administration.

The card is to go with the child as he passes from grade to grade. To be of maximum service all possible information should be recorded when the child enters school, and the other information added from time to time.

GEORGE C. RUHLAND, *Chairman*
I. F. THOMPSON
IRA V. HISCOCK
GEORGE T. PALMER
WALTER M. BRUNET
JESSAMINE WHITNEY
MARY BROWNELL
MERRILL CHAMPION

INSTRUCTIONS FOR MARKING RECORD FORM

(Record in ink)

Name—The name can be written with the given name first or last, it is immaterial.
Sex—Use M for males, F for females.
Color—Use W for white, B for black.
Birth Date—This is recorded most simply by figures. Thus, Oct. 17, 1915, would be 10/17/15.
Parent or Guardian—Write name.
Addresses—Several lines are left for addresses as well as date when new address was recorded.

36 Cypress St.—9/16/25
1320 Oxford Place—1/6/27

Diseases—Year—Record the year when the child has the disease indicated or when the ailment was first noted. This entry should be made out as completely as possible when the child enters school, the facts being ascertained by sending a note home to the parents, or it may be more convenient to question the parent when she or he is present for the first examination. There may be some slight error if it happened that there was no physician in attendance at the time of the child's illness. However, these diseases are quite distinct and are usually events well remembered in most households. If this record is made with care, it will prove most serviceable to the teacher later. When measles breaks out she will know by the record what children will probably not have it because of previously having had it, and she will know those who are apt to contract the disease following exposure to active cases. If a child contracts any of these diseases at a later period during school life, the age should be entered by the teacher at that time.

If Tb in Family, who (relation)—This information should be secured from the parents direct or by note. Record "sister," "brother," "father," etc. Knowledge of the fact that there has been or is tuberculosis in the home should make the teacher doubly watchful of the school pupil from that family.

Immunization—The really important facts are to know whether the child has received the complete series of three inoculations and whether a subsequent Schick test indicates that the child is immune to diphtheria. The date of third treatment can be recorded as 10/16/30, meaning October 16, 1930. It is assumed that the details of the first and second inoculations will be kept on a sheet by themselves and that only the final record will be made on this permanent record card. Record age to nearest year. Give the date when the Schick test indicates that the child is immune from diphtheria. Record in figures as 10/19/32.

If a child entering school at 6 years of age was vaccinated successfully when 3 years of age, record the approximate date as 10/—/24. This example assumes that the exact date is not known but the month and year are. Record age to nearest year when the last successful vaccination was given.

If a child is vaccinated again when 9 years of age, record the date as 4/16/32 and underline the word which indicates the result, namely, whether the vaccination was positive ("a take") or negative (no reaction), or showed an immunity reaction, a reddened area for several days which clears up without the formation of the blister or pustule.

The knowledge that pupils are not susceptible to certain diseases either because of immunization or from having had the disease itself will prove of value to the school authorities.

Physical Examinations—Space is purposely limited here in order to encourage the more thorough but less frequent examination. The longer interval between examinations is recommended in order to discourage the superficial character into which annual examinations so commonly have fallen, and to save the time and labor entailed in the acquiring of great masses of records of which but little use can be made because of the inadequacy of the staff for the purpose in the average school.

Grade—Record school grades as I or V. (Roman numerals.)

Date—Record in figures as 10/13/27.

Parent Present (yes or no)—Write yes if parent or guardian was present at the examination; no, if not present.

Nutrition—Grade in terms of the scale shown, 0—meaning good nutrition, 1—fair, 2—poor, and 3—very poor. This grading is in general terms and rests upon the opinion of the physician. As soon as more exact standards for rating nutrition are available they should be utilized.

Height—Record to nearest inch, children being measured without shoes.

Weight—Record to nearest pound, sweaters, coats and extra wraps of course being removed. (Weight should be with ordinary indoor clothing.)

Standard Weight—Record to nearest pound, taking figure from Wood-Baldwin height-weight-age tables or other more accurate tables when available.

Per cent Deviation + or — —Record in round numbers after computing per cent above or below standard, thus — 6 or + 10.

Posture—Record in terms of the scale. The examiner's judgment must determine the ranking. When nationally accepted standards of rating posture are available they should be used.

Teeth—Record in the general terms of the scale.

Nose-Throat—Record in terms of the scale; the decision being made on the history

(see Recurrent Tonsillitis and Rheumatism at top of card) in conjunction with what is visible from the direct examination.

No separate columns are provided for tonsils or adenoids or mouth breathing or enlarged cervical glands. A specialist to whom the child may be taken by parents will, of course, make his own deductions and it is sufficient in the school examination merely to direct general attention to this area.

Special care is advised in marking this item. There has developed a tendency to mark tonsils on appearance alone. This is a questionable procedure. Something of the history as well as size and appearance should be obtained before definitely designating a defect. Where this is difficult to obtain, and yet the appearance of the tonsils is unfavorable, it is recommended that the symbol 1 (slight) be favored in preference to a 2x. The designation of 2x sets in motion a chain of events involving expense and is also capable of creating misunderstanding between the school physician on the one hand and the parents and family physician on the other. It is true that the child's welfare must not be neglected in the effort to prevent misunderstanding. At present, however, it would seem that tonsil defects are magnified, over-emphasized and reported too freely rather than the reverse.

The experience of teacher and parent will be helpful in detecting adenoids or mouth breathing. Likewise the child's absence records from colds (at the bottom of the card) will be helpful in the later examinations.

Heart—Record in terms of the scale. Unless it is permissible to bare chest and back to make the stethoscopic observation this item should be omitted. An inspection that is so superficial as to be without significance is not justified.

Where suspicious signs are present, a test for rate of pulse recovery may also be made.* The experience of teacher and parent with the child's actions may also be found helpful in supplementing the evidence the physician is able to get directly.

Vision—Record in terms of the scale. It is presumed that the Snellen or equivalent test for visual acuity will be used. If a defect is indicated in either eye, it should be noted. It is not necessary to show on the card the rating of each eye independently. The ophthalmologist who later examines the child will draw conclusions from his own examination, and further detail in the routine school examination will not be necessary.

Hearing—Record in terms of the scale. The whispered voice test is probably used most commonly. The use of the audiometer with which an entire classroom may be tested at once is recommended where the volume of work is such as to warrant the expense of the instrument. This is manufactured and sold by the Graybar Electric Co., Graybar Building, Lexington Avenue and 43d Street, New York, N. Y.

Thyroid—Record in terms of the scale.

Other—Note here any other outstanding matter of importance not already listed.

General—The back of the card may be used to record special details in connection with the examination if this is desired.

It is recommended also that supplementary instruction sheet be prepared locally to help interpret the meaning of the code terms—" slightly," " moderately," " markedly " unsatisfactory. Thus, in the case of vision, it might be explained that inability to see the 20/20 line but yet reading the 20/30 line would be marked 1. Reading the 20/30 but not 20/40 would be marked 2 and inability to read 20/70 line as 3.

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* See procedure in Pittsburgh schools, Dr. Harry Burns, Medical Director.

The Marking Code—The scale for marking shown on the card is largely self-explanatory. Its use is advised for the sake of uniformity and understanding. The grading marks 1, 2 and 3, will, of course, vary with the subjective impressions and diverse methods of individual physicians. As rapidly as reliable standards are developed they should be utilized.

Mark 2 " present," implies a condition more marked and positive than 1. An item marked 2 — should ordinarily be referred to the family physician for further medical advice. However, there are instances where it is inadvisable to follow up this condition with home visits by the nurse. For that reason the character x is reserved as a follow-up symbol, a signal for the nurse to " go ahead " with the case.

Mark 3 is reserved for conditions demanding special or immediate attention. Almost invariably an x would appear with the 3. The special marking of certain cases with a 3 enables the nurse to give them precedence in mapping out her visiting schedule.

Where there has been a previous correction, use the symbol 00, which indicates something different from normal but still not necessarily a defect.

Use — to indicate information sought but not obtained to distinguish from a blank space which would indicate no information sought.

If no mark is made, and the space is left blank, succeeding teachers will be puzzled to know whether the result was negative or whether no observation was made. The maximum value of this card to succeeding teachers is the completeness of the record which comes to them. If it is incomplete, succeeding teachers will not be inclined to place dependence on the record.

N—is a symbol to indicate that the family has been notified of the findings.

/—A diagonal line from lower left to upper right corner of square, and through the defect record, indicates that the school examination was not verified by the family physician.

×—A cross over the entire space, made over the record of a defect, indicates that the matter is receiving professional attention.

These last two marks would represent a termination of the case for that individual item, so far as the nurse is concerned.

The uncrossed off x's represent the remaining work for the nurse.

Absence Record—In the lower part of the card is space for noting the absence record. There are wide columns for each of 7 school years. These columns are divided into two parts, so that absence for each term may be recorded.

The entries in this space are to be made at the end of the term. They represent the summation of the daily experience. They are taken from the Class Room Register on which must be kept the detailed cause of absence in terms of the code indicated on the card.

On the Class Room Register, in place of marking an A for absence it is recommended that a dot (.) be made. When the child returns to school with an excuse or the cause of the absence is otherwise determined, the teacher can then write on top of the dot the appropriate letter indicating the class of absence, whether C, D, S, E, M. As described in succeeding paragraphs all absences can be recorded under one of the five headings. The groups are distinct and their titles self-explanatory and mutually exclusive and the designating letter is purposely made suggestive.

At the end of the term the numbers of each letter showing on the register can be totalled and recorded on the health card.

While this practice involves slight additional work, the securing of accurate information as to the amount, nature and location of illness enables the teacher to understand better the causes of absences, and this in time is of assistance in promoting health and preventing illness. This is as definite a contribution as the discovery and elimination of physical defects.

School Year—Record the years the child has been in school. Thus the child may be in the third grade but, having at some time repeated a grade, this is really his fourth school year.

Name of School—Designate school by name or number.

Grade and Age—Place grade number above, and age in years below, the diagonal line.

Number Registration Days for Child—This is entered for each term. This number may differ somewhat among the children of the class as some children may have entered school after the beginning of the term.

Absence—Total Days—At the end of the term, record here the total days absent. Count half days absence as one-half.

The entries C, D, S, E, M are subdivisions of the total and their sum should equal the total. The purpose of the subdivision is to convey to subsequent teachers the nature of the absences, for these have differing health significance. Twenty days' absence is not of health significance if due to absence from town on a visit, or to exclusion from school not because of the child's illness but because of exposure to another child with some communicable disease. This information on sickness and its nature will prove of value to subsequent teachers in their dealings with and understanding of individual children. The summation of these causes of absence by room and by schools will also be of value to principals and superintendents administratively.

Entries by cause—C, D, S, E, M.

Five distinct classes of absences are recognized, viz.:

(C) Colds and Sore Throat
(D) Disease, Communicable (specific infections)
(S) Other sickness
(E) Exclusion because of exposure to Communicable Disease
(M) Miscellaneous Causes, not sickness of the child

(C) *Colds and Sore Throat*—Under the heading (C) record colds, sore throat and complications associated with colds such as tonsillitis, bronchitis, laryngitis, pharyngitis, influenza, pneumonia.*

(D) *Disease, Communicable*—(so-called diseases of childhood)—This refers to specific communicable disease for which isolation or quarantine are prescribed, such as measles, mumps, chicken pox, whooping cough, German measles, scarlet fever, diphtheria, typhoid, poliomyelitis, smallpox. It also includes transmissible infections such as impetigo, scabies, ringworm and pediculosis.

(S) *Sickness*—(symptomatic, including injuries)—Include here all other sickness not covered by the two items above. For instance, headache, stomach ache, toothache, broken arm, burns, etc.

(E) *Exclusion, Exposure to Communicable Disease*—This is reserved for those absences which are enforced by the school in order to protect other pupils. In this case the child is not ill but is kept from school because of a known exposure to a case of communicable disease. If the child thus excluded contracts the disease,

* Influenza and pneumonia are arbitrarily placed under this heading even though there is good reason for including them under D.

the days' absence following the diagnosis of the disease should be recorded in the register as (D).

(M) *Miscellaneous causes not illness of the pupil, other than above*—This designates absence to go shopping or visiting, to see the oculist or dentist, or to stay at home with a sick parent, or to mind the baby, etc. In other words, the child is not ill, nor is he kept from school because of exposure to communicable disease. This type of absence may account in some instances for one-fifth to one-half of all absences and in epidemics has been known to go as high as 90 per cent of all absence.

SCHOOL HEALTH FORM 2

Name_____ Sex_____ Color_____ Birth Date_____ Parent or Guardian_____

Addresses	Date	Diseases	Year	Diseases	Year	Diseases	Year	Immunization	Date	Age
		Chicken Pox		Smallpox		Rheumatism		Diphtheria—3d TAT		
		Diphtheria		Typhoid		Chorea		Final Neg. Schick		
		Measles		Whooping Cough		Malaria		Typhoid—3d Dose		
		Scarlet Fever		Recur. Tonsillitis		Hookworm		Smallpox—Successful Vac. (underline) Revac. Pos. Neg. Im. Reaction		

PHYSICAL EXAMINATION

If Tb in family, who (relation)

Date

Grade	Date	Parent Present (yes or no)	Nutrition	Height	Weight	Std. Weight	Per cent Deviation + or −	Posture	Teeth	Nose-Throat	Heart	Vision	Hearing	Thyroid	Other

Code: { 0—S[illegible] X—[illegible] } 00—Previous correction; N—Family notified; receiving professional attention

School Year														
Name of School														
Grade and Age														
Number Registration Days for Child														
Absence—Total Days														
(C) Colds and sore throat														
(D) Disease, Communicable														
(S) Sickness, other														
(E) Exclusion exp. to com. dis.														
(M) Misc. causes other than above														

(This space for printing City and Agency)

NOTE: The form is printed to conform to the type page of the JOURNAL. It shows the content but not the exact spacing on the card.

The Problem of Finance in Rural Health Practice*

DOUGLAS L. CANNON, M. D.

Assistant State Health Officer, Montgomery, Ala.

THE governor of Alabama, on September 27, 1923, approved an act of the legislature making available $55,000 as a state-aid fund for county health work. This sum was sufficient at that time to subsidize 22 counties not in a position to carry the entire burden of providing health service for their people. Participation in the fund was made contingent upon the appropriation by a county of a sum of money sufficient to secure a permanent health organization and adequate to do effective work, the amount in each instance to be determined upon the advice and with the approval of the State Board of Health. A further act of the legislature, approved August 26, 1927, provided a subsidy of $2,500 per county for all counties not already receiving state funds for local health work, on condition that these counties make available an appropriation in accordance with the terms specified above.

When the organized counties numbered 33, October 1, 1927, the State Board of Health was aware of the fact that of the 34 counties not then receiving full-time health service only a very few were financially able to make the minimum appropriation of $5,000 theretofore required in order to participate in the county organization fund. On the other hand, among the 34 were a number urgently in need of a well planned and continuous program of health preservation and disease prevention. Therefore, to arrive at a figure that even the poorest counties could meet in order to enjoy the benefits of the fund, two plans suggested themselves. The first was on the basis of the per capita appropriation being made by those counties essentially like the group remaining to be organized. There were 21 such counties, no one of them with a municipality exceeding 10,000 population, the majority without a municipality in excess of 5,000, and 9 altogether rural. This study revealed the average per capita appropriation to be 17.75 cents. The range was from 10.49 cents to 24.15 cents.

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

When the average was applied to the populations of the existing unorganized counties it was found that the appropriations which the State Board of Health might have a right to expect varied from $2,360 in the least populous county to $6,354 in the most populous. The results were not altogether satisfactory. In most instances they represented a need for health work rather than ability to pay. Knowledge of local conditions and character of population justified this conclusion.

It seemed advisable then to determine what the per capita appropriation would mean in terms of tax rate, the assessed valuation of property in the several counties as given in the latest report of the State Auditor being used as a basis. The study of this relationship showed that an appropriation could not be calculated solely on the basis of the average per capita as determined for the organized counties.

To proceed upon such a plan would mean that the appropriation of County A would be equivalent to a tax rate of 7.46 cents per $100 of property as assessed; that of County B, 7.09 cents; County C, 7.75 cents; and of County D, 7.21 cents. Obviously such rates were too high.

The question then arose as to what would be a reasonable rate to apply. To arrive at a solution (the second plan), the average appropriation in cents per $100 of property as assessed, in the group of organized counties used above, was determined. The average was found to be 4.95 cents. To avert criticism from the organized counties that less was being expected of the unorganized—$5,000 having been the minimum amount theretofore approved by the State Board of Health if a county participated in the county organization fund—it seemed wise to exceed the average in arriving at the ideal rate.

How far above the average, though, should the ideal be? It was known, for example, that several of the organized counties making an appropriation approximating 6.5 cents per $100 of assessed property found it difficult to meet the appropriation. Somewhat arbitrary reasoning then seemed to indicate that the ideal should lie between 4.95 and 6.5 cents. As a trial procedure, 5.5 cents was chosen. When this was applied to the property assessments in the unorganized counties, a given county's appropriation of $2,360 on the per capita basis became $1,765 on the property assessment basis, a greater difference than might be apparent without the knowledge that the population of the county in question is 13,300 and the assessed property but little more than $3,000,000. In the case of a second county, $6,354 became $6,152, a negligible difference because the county has property assessed in excess of $11,000,000.

COMMENTS

The Alabama State Board of Health is of the opinion that adequate service cannot be rendered by a county health department that has a smaller personnel than 3, or an annual budget of less than $7,000. Of this amount the State Board of Health is in position to contribute $2,500 from the county organization fund. Unless an arbitrary standard of coöperation is adopted, with the state bearing much the larger share of the burden, it would remain for a county to make a minimum appropriation of $4,500.

The study made of the ability of the unorganized counties to pay for health service revealed that only 7 of the 34 could attain this figure. If, therefore, these less fortunately situated counties are to receive approved health service, means must be provided to care for the deficit after the county organization fund and the local appropriation have been made available.

An equalization fund is not unknown in the operation of certain departments of state government. It should not be unknown in the operation of a health department. State-wide health service, at least in the South, can hardly be attained unless such a fund is set aside to aid counties as equally deserving as others but not able to make more than a small part of the total appropriation needed for adequate protection. Fortunately Alabama has been able to have the equivalent of an equalization fund. This has been made possible through the use of a portion of the money appropriated by the legislature for the general operating expenses of the State Board of Health, together with subsidies from extra-state agencies. When these extra-state subsidies have been withdrawn, an equalization fund must become a reality by legislative enactment.

Finally, the problem of finance, if initially acute, is likely to remain acute over the second and third years of the county health department's life. Normal expansion of work must be provided for. Adequate salary increases must be granted, if stability of organization is to be maintained. To assure these there must be an annual increase in appropriation, certainly after the second year. The source of the added revenue remains to be determined, but sound administrative policy would seem to direct that it be derived from county funds.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE HEALTH OFFICER'S TENURE OF OFFICE

IT IS not possible to prevent completely all changes in the personnel of health departments, either local or state. Our "In Memoriam" resolution at the Chicago meeting included the names of forty members who had died during the year, of whom fifteen were health officers or health commissioners. Since all health officers are not members of our Association, the actual number of health officials who died is probably considerably in excess of fifteen, death causing a number of vacancies which must be filled.

In addition, quite a number of officials return to the practice of medicine or take up some other work which promises freedom from political interference and worry, or more adequate financial returns, better prospects, or some other advantage of sufficient weight to bring about a change in vocation.

Many health officials have been removed because of a change in the dominant political party or through some supposed indiscretion. There are some such cases on record which remind one of the rise and fall of court favorites in Europe in the 17th century. This statement is not made to justify all acts of health officers. Being human, they are capable of error, and, like other people, often make mistakes. In some cases their removal has been justifiable, but in others it has not.

Time is an element in success in health work, and the tenure of office of the average health officer is altogether too short. A report made last October showed an annual turnover of health officers amounting to 14 per cent. This must have meant the slowing up of work, or disturbance of programs for betterment, in many communities. Uncertainty of tenure is apt to cause hesitancy or unwillingness on the part of the health officer to launch a program requiring time for its accomplishment. When the officer is reasonably sure that his ten-

ure of office will be brief, it is almost certain to interfere with his activities and to make him doubtful of the wisdom of initiating measures which require the longest possible period of time for their accomplishment.

The Executive Board of our Association recently sent the following significant message to one of our governors:

The American Public Health Association has long recognized that the security of health protection to the people, the continuity of constructive health programs, and the efficiency of the service are seriously hampered by the frequent shifting of the administrative head of the health department. The Association has also found that where the employment of the administrative head or health officer is in the hands of a board of health or council of members interested in public health, appointed for overlapping terms, sound policies have been established and effective service continuously rendered. For these reasons the Association through its Executive Board urges that you take steps at an early date to assure to the people of your state the benefits of such a policy.

In the instance which brought out this resolution, a change in the office of health commissioner was unavoidable, but we are glad to say that the new appointee was a physician who had had wide experience as a health administrator, and who will, with little or no break, continue the policies and programs so successfully adopted and pushed by his predecessor. We wish that all changes in state health officers could be accomplished with as little disturbance and detriment to the welfare of the people as in this case.

YELLOW FEVER AWARDS

NEARLY 28 years after the demonstration of the agency of the Stegomyia (*Aëdes aegypti*) mosquito in spreading yellow fever,[1] the Congress of the United States has finally given official recognition to this great piece of work and provided a pension of $125 a month to the 16 of those now living who took part in these dangerous experiments, and to the widow of one. In addition, a gold medal will be given to each of the living and to the representatives of those now dead.

The Yellow Fever Commission consisted of Walter Reed, James W. Carroll, Jesse W. Lazear and Aristides Agramonte. Dr. Lazear died of yellow fever after having allowed himself to be bitten by a mosquito. Dr. Carroll, who also allowed himself to be bitten, was seriously ill, but recovered, though some remaining disability is believed to have played a part in his death later. Dr. Reed did not contract yellow fever, and died of appendicitis some years after his return to the United States. Dr. Agramonte, who was an immune, is the only member of that famous Commission now living.

The story of their work has often been told, but cannot be too often repeated. Only those who have lived in those parts of the country formerly visited more or less frequently by yellow fever can appreciate what the disease meant in terror, human suffering and financial loss through interruption of commerce. Fumigation directed toward the extermination of insect carriers is now employed instead of the former disinfection intended to kill the supposed germ. Our ports are now open to ships from any part of the world throughout the year. No longer are vessels tied up at quarantine for weeks and months. Never again will yellow fever be epidemic in any city of our country. The benefits of the discoveries of the Yellow Fever Commission have been extended to every part of the world in which the disease has existed. Its work has been recognized by scientific men everywhere, and abundantly confirmed, not only by foreign commissions, but also in practice.

We rejoice that Congress has finally responded to the urgent representations made for years past and recognized not only the men who directed the work, but those more humble ones who offered themselves for experimental purposes. No greater courage has ever been shown in war or in peace than was displayed by these men.

We regret the necessity of introducing a discordant note, but must call attention to the miserly pittance granted to those through whose agency thousands of lives have been spared and millions of dollars saved. The richest country in the world could well afford adequate recognition of such notable services. However, it marks the beginning, and we may confidently hope that in the future similar services will be more promptly and more suitably rewarded.

We cannot close without mention of the further extension of our knowledge of yellow fever by devoted men working in West Africa, four of whom have given their lives as the price. The findings of our Army Commission have been further confirmed, and there is hope that a vaccine has been developed which will protect those carrying on such studies as well as others who may be exposed through the exigencies of their calling.

REFERENCE

1. The Etiology of Yellow Fever—A Preliminary Note. *Proc. 28th Annual Meeting A. P. H. A.*, October, 1900.

58TH ANNUAL MEETING OF THE A. P. H. A.

Minneapolis, Minn., September 30 to October 5

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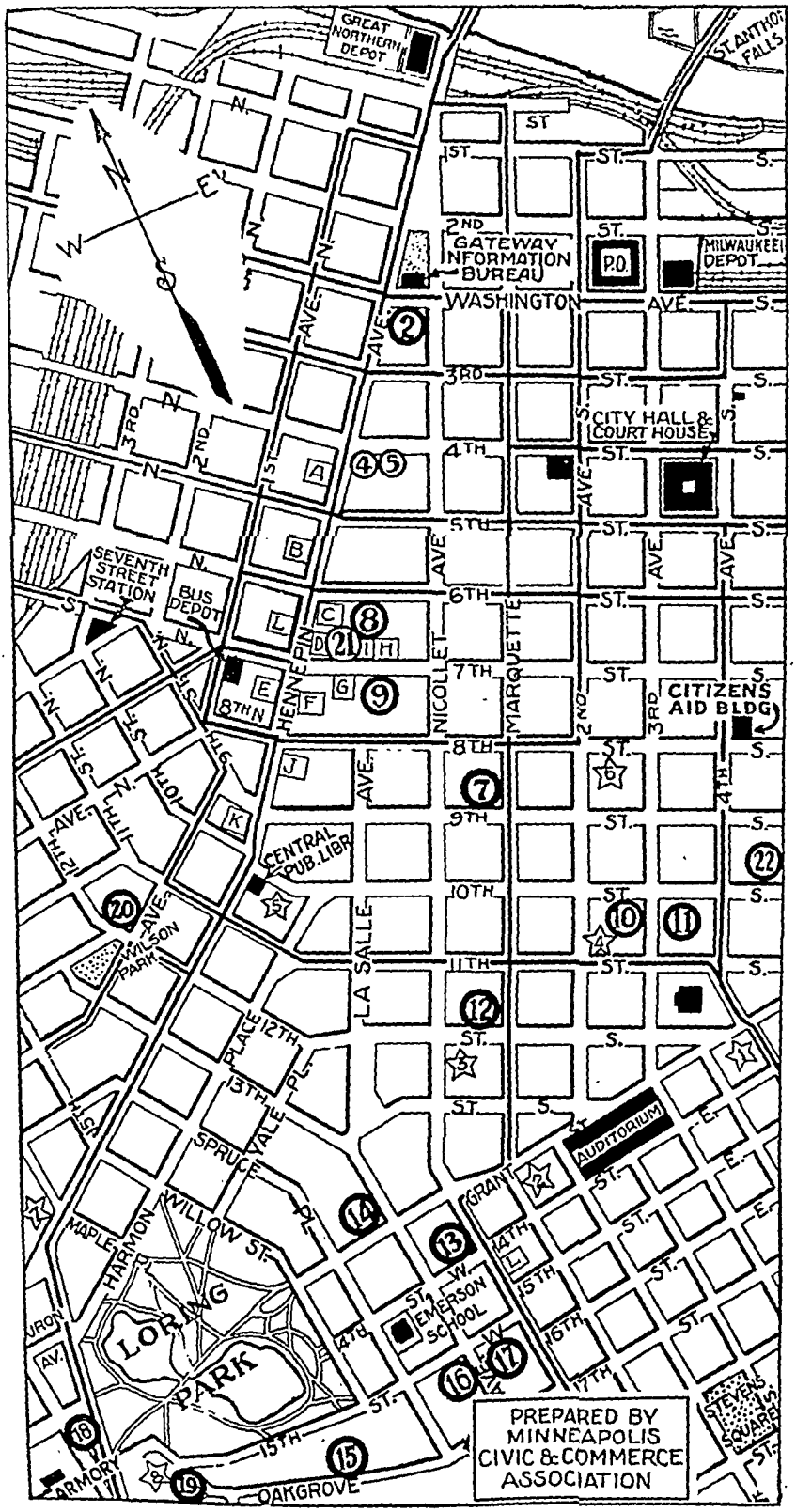


C. W. SHIRK
Member



FRANCIS E. HARRINGTON, M.D.
Member

LOOP DISTRICT OF MINNEAPOLIS



HOTELS

2—Nicollet
4—Andrews
5—Vendome
8—Dyckman
21—Majestic
9—Radisson
7—St. Regis
20—Hastings
22—Francis Drake
10—Leamington
11—Curtis
12—Sheridan
14—Maryland
13—Kenesaw
17—Bedford
16—Buckingham
15—Oak Grove
19—510 Groveland
18—Plaza

THEATRES
(Squares)

A—Palace
B—Unique
C—Aster
D—Grand
I—Strand
H—Garrick
G—Seventh Street
F—Lyric
E—Pantages
J—State
K—Hennepin Orpheum
9th St. & LaSalle Avenue
New Minnesota Theatre

CHURCHES
(Stars)

6—Church of Redeemer
5—First Baptist
4—Second Church Scientist
3—Westminster Presbyteria
1—Central Lutheran
2—Wesley M. E.
8—St. Mark's
7—Basilica of St. Mary

ASSOCIATION NEWS

MINNEAPOLIS HOTELS

FOR the convenience of delegates, a number of Minneapolis hotels are listed with their rates. A map appears on page 542 showing the location of these hotels and their proximity to the Auditorium, where all the technical sessions and the exhibits will be held.

It is advisable to engage rooms in advance of the meeting, and a reservation blank is printed on page 545 for that purpose.

All applications should be made directly to the hotels.

HOTEL RATES

Hotel	*Address*	*Room Capacity*	*One Person*		*Two Persons*	
			With Bath	*Without Bath*	*With Bath*	*Without Bath*
Curtis	10th St. & 4th Ave. S.	825	$2.00–3.00	.....	$3.00–6.00	.....
Nicollet	Wash. at Henne. & Nicollet Aves.	600	2.50–6.00	$2.00	4.00–8.00	$3.50
Leamington	3d Ave. S. & 10th St.	500	2.50–6.00	.....	4.50–10.00	.....
Radisson	7th St. Bet. Henne. & Nicollet Aves.	500	3.00–6.50	2.00–2.75	5.00–30.00	4.00
Sheridan	Marquette Ave. & 11th St.	457	2.50–3.50	1.50–2.00	3.50–5.00	2.50–3.00
Andrews	Hennepin Ave. & 4th St.	329	2.50–6.00	2.00	4.00–7.00	3.00
Dyckman	6th St. Bet. Henne. & Nicollet Aves...	300	2.00–5.00	.....	4.00–7.00	.....
Vendome	4th St. Bet. Henne. & Nicollet Aves.	250	1.75	1.25–1.50	3.00	2.00–2.50
Oak Grove	230 Oak Grove St.	200	3.00–3.50	.....	4.50–5.00	.....
Maryland	LaSalle Ave. & Grant St.	172	2.00–3.00	.....	3.00–15.00	.....
Plaza	Hennepin Ave. & Kenwood Parkway	160	2.50–6.00	.....	3.50–6.00	.....
Francis Drake	10th St. & 5th Ave. S.	150	2.50–5.00	.....	3.50–6.00	.....
Hastings	12th St. & Hawthorne Ave.	150	1.75–4.00	.....	2.50–5.00	.....
Buckingham	LaSalle Ave. & 15th St.	138	3.00–6.00	.....	4.00–7.00	.....
Russell	16 S. 4th St.	125	1.50–2.50	1.25–1.50	2.50–4.00	2.00–3.00
Majestic	7th St. & Hennepin Ave.	112	1.50–2.00	1.00–1.50	2.50–3.00	1.75–2.00
510 Groveland	510 Groveland Ave....	110	4.00–15.00	.....	6.00–17.00	.....
Bedford	1501 LaSalle Ave.	100	2.00–3.00	.....	3.00–4.00	.....
Kenesaw	14th St. & Nicollet Ave.	100	2.00	1.25–1.50	3.00	2.50
St. Regis	Marquette Ave. & 9th St.	58	1.50–3.00	.....	2.50–4.00	.....

NATIONAL SAFETY CONGRESS

The National Safety Council and the American Public Health Association meet this year in the same week, the former in Chicago, the latter in Minneapolis. As Chicago is en route to Minneapolis, it will be possible for physicians and public health workers interested to include sessions of the National Safety Congress in their week's program. The medical sessions of the National Safety Congress come on Monday and Tuesday, and possibly Wednesday, whereas the A. P. H. A. Industrial Hygiene sessions in Minneapolis will take place on Thursday and Friday.

DR. BISHOP HONORED

E. L. Bishop, M.D., Commissioner of Health, Nashville, Tenn., Secretary of the Health Officers Section, A. P. H. A., has been appointed a member of the Board of Scientific Directors of the International Health Division of the Rockefeller Foundation. The other members of the board are: F. F. Russell, M.D., General Director of the International Health Division; Rufus Cole, M.D., the Rockefeller Institute; Louis I. Dublin, Ph.D., the Metropolitan Life Insurance Company; Wade H. Frost, M.D., Johns Hopkins School of Hygiene and Public Health; W. G. Smillie, M.D., Harvard School of Public Health; and C.-E. A. Winslow, Dr.P.H., Yale School of Public Health. This group will give expert advice concerning budgets, policies and programs, and with regard to certain activities will serve as a special executive committee with delegated authority.

VIRGINIA PUBLIC HEALTH ASSOCIATION

The Virginia State Public Health Association held its annual meeting in Richmond, Va., February 20. The following officers were elected for the year 1929: *President,* W. B. Foster, M.D., Richmond; *1st Vice-President,* W. H. Pott, M.D., Norfolk County; *2d Vice-President,* G. F. McGinnis, M.D., Richmond; *Secretary-Treasurer,* Fred J. Wampler, M.D., Richmond; *Representative to the A. P. H. A.,* M. G. Perrow, Lynchburg.

NEW MEMBERS

Joseph M. P. Allaire, M.D., Joliette, P. Q., Health Commissioner

Harold E. Babbitt, M.S., Urbana, Ill., Professor of Sanitary Engineering, University of Illinois

William E. Ayling, M.D., Syracuse, N. Y., Health Supervisor of School Children

M. B. Beckett, M.B., Saginaw, Mich., City Physician and Assistant Health Officer

J. William Boren, M.D., Marinette, Wis., City Health Commissioner

J. Adelard Boucher, M.D., Watertown, Mass., Health Officer

Alice Britton, R.N., Charleston, W. Va., Public Health Nurse, Kanawha County Health Unit

Edward F. Brown, New York, N. Y., Director, Diphtheria Prevention Commission, City Department of Health

Ira C. Brown, M.D., Seattle, Wash., Medical Inspector, Public Schools

Joseph A. Chapman, B.Sc., New York, N. Y., Clinical Pathologist, Chapman's Pathological Laboratory

Raymond S. Crispell, M.D., Kingston, N. Y., School Physician

Jess L. Cunningham, R.N., Beckley, W. Va., Health Nurse, Raleigh County

Paul M. Drake, M.D., Coquille, Ore., Coos County Health Officer

Ashton W. Ecklund, B.Sc., Bismarck, N. D., Instructor in Hygiene and Sanitation in local hospital

Heward E. Elmer, B.S., Detroit, Mich., Bacteriologist, Owen Clinical Laboratory

Robert C. Farrier, M.D., Homer, La., Director, Claiborne Parish Health Unit

C. B. Finefrock, M.D., Port Clinton, O., Health Commissioner, Ottawa County

John S. Fulton, M.D., Emporia, Kan., County Health Officer

Beulah Gerber, Painesville, O., City and Township School Nurse

Ollie M. Goodloe, B.S., Booneville, Ky., Director, Owsley County Health Department

Arthur H. Graham, M.B., D.P.H., Montgomery, Ala., District State Health Officer

G. Webster Hallett, Osterville, Mass., Member, Local Board of Health
Charles F. Herm, Daytona Beach, Fla., Clinical Pathologist (Assoc.)
William C. Humphries, M.D., Griffin, Ga., Commissioner of Health, Griffin and Spalding County
Laura E. Jones, M.D., Syracuse, N. Y., Examining Physician, Solvay School System
Thomas Kelly, V.M.D., Philadelphia, Pa. (Assoc.)
Jonas E. King, M.D., Girard, O., Health Commissioner
Alvin Kirmse, M.D., Tucson, Ariz., City Health Officer
Richard C. Leonard, Fargo, N. D., Director, School Dental Program
Vivian E. Linden, Alhambra, Calif., Public Health Nurse, Los Angeles County Health Department
Eugene R. Linklater, M.D., Kenmore, N. Y., Health Officer
Frank E. McCord, M.D., Topeka, Kan., County Health Officer
Charlotte McLoughlin, R.N., Charleston, W. Va., Public Health Nurse, Kanawha County Health Unit
Louis Mendelsohn, M.D., Saratoga, Calif., Deputy Health Officer, Santa Clara County
Henry A. Mentz, Hammond, La., Consulting Engineer
S. C. Moore, M.D., Cadillac, Mich., Health Commissioner, Wexford County
Charles F. Neergaard, New York, N. Y., Hospital Consultant (Assoc.)
Arthur W. Newitt, M.D., Birmingham, Mich., Health Officer
Helen L. Palliser, M.D., Poughkeepsie, N. Y., Medical Inspector of Schools
Edward W. Pape, Lakewood, O., Teacher of Biology, Lakewood High School
Julius Pizzoferrato, Steubenville, O., Health Commissioner
Arthur O. Ratliff, Charleston, W. Va., Sanitary Engineer
Richard E. Reinke, B.S., Atlanta, Ga., Sanitary Engineer
Horace M. Roberson, M.D., Cleveland, Tenn., Health Officer
J. N. Rosenberger, V.M.D., Philadelphia, Pa. (Assoc.)
Henry C. Schumacher, M.D., Cleveland, O., Director, Child Guidance Clinic
C. Morley Sellery, M.D., Los Angeles, Calif., Temporary Assistant Director, Dept. of School Health
H. B. Senn, M.D., Beaufort, S. C., County Health Officer
Mrs. Romaine E. M. Smart, New Haven, Conn. (Assoc.)
Mrs. June Snell, R.N., Morgantown, W. Va., County Nurse
Mitchell B. Stock, Bridgeport, Conn., Public Health Engineer, Nustone Products Corp.
Normal R. Sullivan, M.D., Santa Cruz, Calif., City Health Officer
Louis-Rene Vezina, M.D., D.P.H., Terrebonne, P. Q., County Medical Officer of Health

DECEASED MEMBERS

Robert M. Boyd, M.D., Fort William, Ont., Can. Elected member 1926
F. B. Forbes, Boston, Mass. Elected member 1905
L. W. Leiter, D.Sc., Baltimore, Md. Elected member 1928

..... (*Cut off on this line*) .....

HOTEL RESERVATION BLANK

To .....
(Name of Hotel)

Please reserve for me.....rooms for.....persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address .....

City ..... State .....

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Making a Morbidity Survey—In 1925, J. V. DePorte, M.D., Director of the Division of Vital Statistics of the New York State Health Department, outlined a project for obtaining morbidity statistics through direct reporting by attending physicians. In 1927 the active interest of 150 physicians having been secured, a survey was commenced which lasted for 12 months. One hundred and seven physicians serving a population of about 101,000 reported 98,069 cases of sickness.

The list of causes of illness must be brief since a busy rural practitioner cannot be asked to give the time necessary to fill out a blank containing all of even the more important types of sickness. The subdivisions were limited to sex; no provision was made for age, occupation and other facts of personal history, or for the duration and severity of illness. One proposed and very desirable heading, "All Other Types of Illness," which would have given a picture of the entire morbidity situation, had to be omitted

SUGGESTIONS FOR REPORTING

In using the form on the reverse side of this card please follow the directions carefully.

Use the card daily, putting a mark for each *new* case. Thus

Disease	Males	Females
Tonsillitis	///	//

And as further new cases are seen, simply add to the check marks, thus

	////	⧸⧸⧸⧸

The value of this record lies in its completeness; it is therefore important to send in the card weekly, even when NO new cases of the specified disease are seen.

Under "Colds" enter bronchitis, coryza, "grippe," laryngitis, pharyngitis and similar conditions.

Under "Children, diseases of" enter all forms that are at present not reportable or shown elsewhere on the card; for instance rickets, pyelitis, malnutrition, etc.

Under "Neuroses" include conditions such as "worry," "indigestion," "neuritis," any condition that is in your opinion based on a functional disturbance of the nervous system.

Under "Surgical" enter operations for any cause, injuries due to accidents, etc.

11-23-26-5000 (21-2953)

SICKNESS REPORT: Week ending.....192....

The number of *NEW CASES* attended by me during the week ending Saturday midnight was as follows:

Disease	Males	Females
Appendicitis		
Arteriosclerosis		
Cancer		
Children, diseases of (outside of reportable and those listed on this card)		
Colds		
Diabetes		
Diarrhea and enteritis (under 2 years)		
Digestive disorders, other		
Gonorrhea		
Gynecological cases:		
a. Operative		
b. Non-operative		
Heart disease		
Neuroses		
Nephritis, acute		
Nephritis, chronic (*Bright's disease*)		
Rheumatism:		
a. Acute rheumatic fever		
b. Chronic arthritis		
Surgical cases, operative, traumatic (except gynecological)		
Syphilis		
Tonsillitis		

(Signed)

.....M.D.

P.O.....

IMPORTANT Please mail report IMMEDIATELY even if NO NEW CASES of above named diseases were attended.

because certain physicians preferred not to disclose the general extent of their practice.

The physicians were asked to report only new cases of the various types of sickness indicated and not new patients, and were furnished stamped and addressed envelopes in which to return the cards to the State Health Department each week.

Results of the study made in New York State were reported by Dr. DePorte in the *Journal of the American Medical Association*, Feb. 16, 1929.

A Continuous Appraisal—George D. Lummis, M.D., Health Officer of Middletown, O., submits a leaf from a book which lies on his desk at all times. It gives a complete statistical record for the year 1928, and by a glance he can answer almost any question which may be directed to him. In this book are also kept the records of all reportable diseases, the laboratory reports on milk, a sheet showing mortality and morbidity for each month, the number of deaths and births, also the five leading diseases, the number of cases reported and deaths therefrom. From this he is practically able to complete his *Ap-*

PAGE GIVING 1928 STATISTICS

DEATHS 1928

Causes	Under 1 mo.	1 mo.–1 yr.	1–5	5–10	10–20	20–30	30–40	40–50	50–60	60–70	Over 70	Male	Female	Colored	Foreign	Total
Heart Disease	2			1	2	3	1	10	22	14	11	30	36	6	5	66
Pneumonia	3	20	9	3	2	4	4	1	3	1	11	35	26	15	2	61
Apoplexy						1	2	2	4	11	17	13	24	3	1	37
Nephritis				1		1	2	2	3	5	7	12	9	7		21
Cancer					1		1	1	6	6	5	5	15	1	3	20
Premature Birth	17	2										11	8	3		19
Gastroenteritis		15	3	1								15	4	1	1	19
Tuberculosis, Pulm.				1	1	6	1	3	3		1	7	9	2		16
" Other		1		3	1	1	1					4	3	2		7
Arteriosclerosis										3	8	4	7	1	1	11
Auto Accidents			2	2	1		3				1	8	1	1		9
Homicide						2	1	1	3			7		2		7
Accident of Birth	5		1				1					4	3			7
Diabetes									1	3	1	4	1			5
Influenza		1		1			2					3	1	1		4
Septicemia			1		1	2			1		1	6				6
Accident		1		1			1		1			4				4
Scarlet Fever			2		2							4				4
Burns						1	2					3		2		3
Puerperal Sept.						1	1						2			2
Suicide							1			1		1	1			2
Hernia									1	1		1	1			2
R. R. Accident						1		1				2		1		2
Pernic. Anemia									2				2	1		2
Typhoid Fever						2						2		1		2
Mastoiditis			1		1							1	1			2
Whooping Cough			2										2			2
Appendicitis						1						1				1
Alcoholism									1			1				1
Gall-stones									1				1			1
Atrophy of Liver								1				1				1
Asthma										1		1				1
Pancreatitis									1			1				1
Strychnia Poison			1										1			1
Tetanus				1								1				1
Peritonitis						1							1	1		1
Puerp. Nephritis								1					1			1
Intest. Obstr.			1										1			1
Meningitis				1								1		1		1
Stillborn												20	18			38
Total	27	40	23	16	12	27	24	23	53	46	63	193	161	52	13	354

Estimated Population 34,000 Death Rate per 1,000 *10.4*

REVERSE OF STATISTICAL PAGE SHOWN ON PAGE 547

DEATHS BY WARDS 1928

Ward	1st	2d	3d	4th	Total
Male	7	48	53	85	193
Female	10	41	50	60	161
Total	17	89	103	145	354

Death Rate 10.4

BIRTHS BY WARDS 1928

Ward	1st	2d	3d	4th	Total
Male	29	103	123	219	474
Female	28	110	118	190	446
Total	57	213	241	409	920

Birth Rate 27

DEATHS AND BIRTHS PAST 10 YEARS

	Deaths	Rate	Births	Rate
1919	253	11.5	692	31.5
1920	262	10.9	788	32.8
1921	242	9.7	737	29.5
1922	264	9.4	822	30.4
1923	278	9.9	847	30.2
1924	271	9.3	863	29.5
1925	269	8.9	855	28.5
1926	311	10.0	872	28.1
1927	278	8.7	858	27.0
1928	354	10.4	920	27.0

INFANT MORTALITY PAST 10 YEARS

1919	72
1920	69
1921	61
1922	70
1923	74
1924	67
1925	61
1926	69
1927	56
1928	73

REPORTABLE DISEASES 1928

	Cases	Deaths
Tuberculosis, Pulm.	34	16
" Other	7	7
Diphtheria	18	0
Small Pox	72	0
Typhoid Fever	11	2
Scarlet Fever	285	4
Measles	83	0
Pneumonia	33	61
Syphilis	54	0
Whooping Cough	0	2
Trachoma	3	
Poliomyelitis	1	0

NURSES' VISITS 1928

Jan	2,452
Feb	2,602
Mar	2,220
Apr	2,301
May	2,168
Jun	1,546
Jul	1,586
Aug	1,639
Sep	2,093
Oct	2 030
Nov	1,956
Dec	1,566
Total	24,059

10 LEADING DISEASES AS CAUSE OF DEATH

Heart Disease	66
Pneumonia	61
Apoplexy	37
Tuberculosis (all)	23
Nephritis	21
Cancer	20
Premature Birth	19
Gastroenteritis	19
Arteriosclerosis	11
Auto Accidents	9

DEATHS BY NATIVITY AND COLOR

Deaths, Foreign born	13
" Colored	52

BIRTHS BY NATIVITY AND COLOR

Births, Foreign born	30
" Colored	95

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praisal Form, prepare his Annual Report for the City of Middletown, and his Yearly Report to the State Health Department.

Dr. Lummis feels that such a record book would be of great help to health commissioners in cities of 100,000 population or less.

Pasteurized Milk in Massachusetts—The Massachusetts Department of Public Health has recently distributed, through boards of health, physicians and others interested in public health, a statement of the requirements in that state with respect to pasteurization of milk. The state law requires that milk be heated to 140–145° F. for 30 minutes, the object of pasteurization being to destroy the disease germs which are sometimes found in milk. In the last 20 years over 600 milk-borne epidemics have been reported in this country. There is no record of milk-borne epidemic due to properly pasteurized milk.

LABORATORY

C. C. YOUNG

THE CULTIVATION OF ENDAMEBA GINGIVALIS (GROS) FROM THE HUMAN MOUTH *

CHARLES A. KOFOID, PH. D., SC. D., FELLOW A. P. H. A., AND HERBERT G. JOHNSTONE

HOWITT'S (1925) modification of the Locke's egg slant-albumen medium of Boeck and Drbohlav (1924) has proved to be by far the best medium for the growth of amebas from the mouth of man and the monkey. It has been used with great success in routine examination and culture work. Several strains of *Endameba gingivalis* have been cultivated in this laboratory for extended periods, one strain having been maintained for 33 months. With the proper care a strain of ameba may be cultured indefinitely.

The Locke's egg-albumen (L. E. A.) medium consists of coagulated egg slants (containing a small amount of Locke's solution) used as a solid base with the addition of 6 to 10 c.c. of Locke's albumen solution.

1. *Egg slants*—The egg slants are made by cracking 8 washed, fresh eggs into a liter flask containing glass beads; the flask is shaken vigorously until the eggs are homogeneous and 100 c.c. of Locke's solution are added. This mixture is tubed through a sterile apparatus and inspissated in the autoclave for 15 minutes, at 15 lbs. pressure, with all valves closed. The entrapped air is replaced carefully with steam and the slants sterilized for 15 minutes at 15 lbs. pressure. This method produces an evenly coagulated slant without air bubbles.

2. *Locke's solution*—The formula for the Locke's solution used is:

NaCl	9 gm.
$CaCl_2$	0.2 gm.
KCl	0.42 gm.
$NaHCO_3$	0.2 gm.
Glucose	0.251 gm.
Distilled H_2O	1,000 c.c.

The Boeck-Drbohlav formula contained 2.5 gm. of glucose and only 0.4 gm. KCl.

This solution is sterilized in the autoclave at 15 lbs. pressure for 15 minutes. Prolonged sterilization should be avoided as there is a tendency for the glucose to be reduced and a white precipitate of $CaCO_3$ to be formed. If this happens, the fluid should be discarded.

Heretofore the preparation of Locke's solution has consumed much time in the laboratory. The solution was made in 4-liter amounts and, as large quantities were continuously being used, frequent weighings were necessary. The utmost care must be used in the preparation and sterilization as the amebas are very sensitive to any variation in the salt content. The method now followed consists in making separate concentrated solutions of the various ingredients and adding them to sterile distilled water whenever the medium is needed. The following is 40 times the common formula of Locke's solution:

* From the Protozoölogical Section of the California Stomatological Research Group and the Department of Zoölogy of the University of California, under the direction of Professor Charles A. Kofoid, aided by grants from the Carnegie Corporation, the American Dental Association, and the Associated Radiograph Laboratories of San Francisco, Calif.

Salt Solution

Sodium chloride	360 gm.
Calcium chloride	8 gm.
Potassium chloride	16.8 gm.
Water	2,000 c.c.

Sterilize in autoclave for 30 minutes at 15 lbs. pressure.

Sodium Bicarbonate Solution

Sodium bicarbonate	8 gm.
Water	100 c.c.

This solution must be prepared carefully to prevent absorption of carbon dioxide from the air, and it must not be heated or shaken vigorously. The solution is filtered through a fine Berkefeld candle.

Sugar Solution

Dextrose	25.1 gm.
Water	500 c.c.

The sugar solution is sterilized in the Arnold for 20 minutes daily on 3 successive days.

The salt solution is put up in 110 c.c. amounts, the bicarbonate in 5 c.c. amounts and the sugar solution in 10 c.c. amounts. The flasks of salt solution and the tubes of dextrose are capped with paper while the tubes of sodium bicarbonate are corked and covered with paraffine.

To make 2 liters of Locke's solution take a flask of salt solution (110 c.c.), a tube of sodium bicarbonate solution (5 c.c.), a tube of dextrose solution (10 c.c.), and add to 1,885 c.c. of sterile distilled water. The above solutions are made every 3 months and can be kept indefinitely. Two liters of Locke's solution can thus be prepared in about 5 minutes, which is of great advantage when needed in a short time or in cases of emergency.

3. *Locke's albumen-solution*—The white of one egg is carefully cracked into a sterile liter flask containing glass beads, shaken vigorously until frothy; then 500 c.c. of Locke's solution and 20 c.c. of N/20 HCl are added. This quantity of acid proved to be about the right amount to add to a liter of fluid in order to give a pH 7.4–7.6. The remaining 500 c.c. of Locke's solution is added and the whole mixture shaken thoroughly and filtered through a Berkefeld candle. This sterile medium is added aseptically in 6–10 c.c. amounts to the egg slants.

It is possible to make the Locke's egg-albumen medium without filtering, but it has been the experience that the filtered medium gives by far the most satisfactory results. The unfiltered medium is prepared exactly as the filtered with the exception that 2 egg whites instead of one to a liter of Locke's solution are used. The eggs must be sterilized in 90 per cent alcohol before cracking and aseptic precautions observed to avoid contamination. An uninoculated control tube should be run at the time of each transplant.

The medium is warmed to 37° C. previous to inoculation with either fresh or culture material. Subgingival exudate or pus is removed by sterile sharpened applicator sticks or sterile dental scalers, and introduced into the culture tubes. The tubes should be placed immediately in the incubator at 37° C. and at no time should they be subjected to prolonged chilling.

Cultural transplants are made by removing a small amount of the material which collects in the angle formed by the egg slant and the side of the tube with a sterile Pasteur pipette and inoculating this substance into fresh medium warmed to 37° C. Transplants are made every 48 hours.

In addition to Locke's egg-albumen medium several other mediums were tried with the hope of finding one that would (1) permit a growth period of more than 48 hours without transplanting; (2) eliminate some of the harmful types of bacteria and the flagellate *Trichomonas buccalis;* (3) produce rich cultures; and (4) be easily prepared and possess a simple formula.

Locke's-egg slant blood medium reduced the number of bacteria considerably but after the first few transplants

the amebas became scarce. It was found, however, that the cultures could be transplanted every 72 hours instead of the usual 48.

The Ringer-albumen-starch-acriflavine medium used so successfully in the culture of *Endameba dysenteriae* and *Councilmania dissimilis* in this laboratory, proved of no use in the cultivation of *E. gingivalis* of man. As acriflavine is lethal for *E. gingivalis* in dilutions stronger than 1–200,000, the weaker dilutions proved inadequate in eliminating the harmful flagellate and bacteria.

Locke's egg-albumen medium with the addition of rabbit or sheep serum (3 per cent) caused a temporary increase in the number of amebas, but after 6 or 7 transplants the organisms steadily decreased, and although they persisted never again rose to the richness of the first cultures.

The medium consisting of Loeffler's serum slants and Locke's albumen caused the amebas to disappear completely after 48 hours of growth.

Following the suggestions of Koch (1926), the triaminotriphenyl methane dyes, acid fuchsin (National Aniline and Chemical Co.) and ethyl violet (Grübler), were added to L. E. A. in various dilutions to prolong the life and rid the cultures of the harmful bacterial and flagellate forms. It was found, however, that the dilutions suggested as being bactericidal and not amebicidal destroyed the strains of human and monkey amebas in one or two transplants. The ethyl violet in dilutions of 1–50,000 and 1–100,000 proved too severe; the acid fuchsin 1–1,000 did not kill the amebas but reduced the bacteria and *Trichomonas* considerably. It was found that these latter cultures had to be transplanted every 48 hours as usual. A small amount of sterile starch was added to each culture with the hope of prolonging the period between transplants. After 48 hours' incubation some very interesting observations were made. The amebas had increased greatly in size and number while the bacteria and *Trichomonas* had decreased. By the addition of a small amount of starch to the acid fuchsin L. E. A. medium, transplants could be made every 4 days instead of 48 hours. After 4 to 6 transplants the dye was found to be too severe as most of the amebas disappeared. After the second or third transplant in the medium containing the dye, the strains were put in starch L. E. A. without acid fuchsin and the number of amebas greatly increased. It was found that this temporary growth in the presence of acid fuchsin in many cases totally eliminated the flagellates and many of the bacteria.

The most interesting result obtained was that *Endameba gingivalis* was capable of ingesting starch grains. The starch cultures of both human and monkey amebas after 24 or 48 hours' incubation contained many large, sluggish amebas with the endoplasm completely packed with starch grains in various stages of digestion. The pseudopodia were usually few in number and very large. Thirty-two amebas measured in the longest diameter gave an average of 29 μ. This is an increase in size of approximately 50 per cent. A motile ameba was seen to approach a starch grain many times its own size, and after struggling with it for about 10 minutes, it finally moved to a smaller grain which it ingested in an incredibly short time. The formation of a crown of spicule-like pseudopodia was observed on the posterior end of many amebas, to which were attached clumps of small starch grains. Cultures have been maintained for 10 days containing quantities of amebas and *Trichomonas*, both of which were very active and full of starch grains. It is a general rule that cultures of amebas containing *Trichomonas buccalis* soon become foul, and within 48 or 72 hours all of the amebas will have disappeared. With the addition of a small

amount of starch, amebas may be made to tolerate *Trichomonas buccalis* for extended periods. These long period cultures do not always bear transplanting.

With the examination of stained starch culture slides (Schaudinn and iron-hematoxylin) many interesting facts were disclosed. In addition to the abnormal size, many amebas contained within the endoplasm quantities of lightly stained starch grains in various stages of digestion. Some of the grains that had been recently ingested were of the typical angular type while others, partly digested, had been completely rounded in form. It is of interest to note that no vacuoles could be seen surrounding the grains. The pseudopodia were coarsely alveolar and in a few instances clear and non-granular. The endoplasm was distinctly alveolar or coarsely granular and occasionally contained a few cocci and bacilli. After 48 hours' growth many of the amebas became much smaller and rounded. In these forms the ectoplasm was generally lacking, and if present at all, was reduced to a uniform film of 1 or 2 μ in thickness. The liquid contained in the vacuoles was tinged a delicate blue due to the presence of the digested starch. The peculiar type of vacuolation and the heavily staining, granular endoplasm in amebas from starch mediums is in striking contrast to those from either a normal culture or direct smear. The nucleus is the part of the ameba that undergoes the most drastic change. It becomes larger, with an average size of 6 μ, and is generally spherical. The chromatin is completely disarranged and assumes many bizarre formations. Although there are forms in the early cultures that resemble the beaded-central karyosome type of nucleus most of the amebas have nucleuses of extraordinary pattern. The chromatin occurs as huge blobs, coarse granules or irregular aggregates distributed throughout the nucleus. In one ameba 3 nucleuses were found, a fact not hitherto reported. An observation of interest is the peculiar clearness, distribution and number of linin fibers in the nucleuses.

The difficulties encountered in the cultivation of the ameba from the human mouth are not numerous and it is comparatively easy to maintain a strain indefinitely. *Endameba gingivalis* is sensitive to any great change either in the medium or temperature, and it is therefore essential to have carefully prepared mediums and not to subject the cultures to prolonged chilling. The Locke's egg-albumen medium is usually employed in our laboratory for general routine and culture work. The starch medium is used very effectively for the production of rich cultures and the maintenance of stock strains. Starch provides a source of food and the amebas appear to thrive on it. Although many abnormal and rounded forms occur in the starch cultures the normal forms persist in great numbers. Much time is saved as these cultures are transplanted every 4 or 5 days. A judicious use of dyes in combination with either plain L. E. A., or L. E. A. plus starch, rids the cultures of many of the harmful bacteria and flagellates so commonly found in the human mouth.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

National Safety Council Issues Form for Study of Fatal Accidents in the United States—The National Safety Council has prepared a form for use in state bureaus of vital statistics for the description of the more than 90,000 deaths which occur from accidents each year in the United States. At the present time, statistics for fatal accidents in the United States are presented each year only under the titles of the *International List of Causes of Death,* and these give information chiefly on the means of accident.

The new form drafted by the National Safety Council will enable state registrars to secure the following additional facts: the results of the accident, number of dependents left by the deceased, and the class or kind of accident, whether it occurred in the home, in industry, as the result of a vehicular accident, or from other public hazards.

For home accidents, the means of injury are specified, whether the accident was due to a fall, to burns and scalds, asphyxiation, poisoning, or cuts or scratches. For industrial accidents, practically the same information will be gathered for fatalities reported to the state bureaus of vital statistics as are now collected by workmen's compensation commissions.

It is proposed to show the number of industrial accidents involving machinery, vehicles, explosions, electricity, fires and hot substances, poisonous and corrosive substances, falling objects, the handling of objects and the use of hand tools, etc. For vehicular accidents it is purposed to collect facts as to whether the person killed was the pedestrian or driver, whether the accident was the result of a collision, who drove the vehicle, the age and sex of the driver, and other important information needed for accident prevention purposes. For public accidents not involving a vehicle, the statistics will attempt to show whether death resulted from a street or sidewalk accident, in buildings or structures, by drowning, through the use of firearms and through other public accidents not involving a vehicle. On the reverse side of the form a schedule of definitions is given which will guide local and state registrars in the classification of accidents.

When this system goes into full effect in each of the states, it is hoped that the resulting statistics will provide the basis for a broad-gauge accident prevention movement directed at accidents in the home, in industry and on our streets. The form was drafted by a joint committee representing the Statistics Section of the National Safety Council and the Section on Vital Statistics of the American Public Health Association.

The form should be of interest to insurance men, and copies may be obtained from the Statistical Division of the National Safety Council, 108 East Ohio Street, Chicago, Ill.

Tuberculosis in School Children—The Department of Public Health of Massachusetts began in 1924 a 10-year program for the examination of the school children of the state. This study is based on 42,071 children who were given the Von Pirquet tuberculin test during a period of 3 years. The percentage of reactors in the children studied shows a gradual upward trend. Of 902 children aged 5 years, 20.8 per cent

gave a positive test; 30.4 per cent of 5,451 children aged 12 years were positive, and 34.6 per cent of 1,920 children aged 15 years were positive. The study showed no marked variation in the number of reactions in the children of different nationalities when there was no history of contact. But approximately twice the number of children reacted to the tuberculin test when there was a history of exposure to a case of pulmonary tuberculosis. The lowest percentage of contact reactions was present among children of mothers born in England or Scotland. Of 223 exposed children, 38.5 per cent gave positive reactions. Among the non-contacts of the same nationality 22.8 per cent of 1,623 children were positive. In the Latin group, which included children of mothers born in France and Portugal, 55.9 per cent of 259 exposed children were positive, as against 27.5 per cent of 1,123 non-exposed children. The Teutonic group, including children of German and Austrian mothers, showed the highest percentage of reactions among the contacts. Of 75 contacts, 73.3 per cent were positive, as against 24.0 per cent of 533 non-contacts. In some instances there was a much higher incidence of infection among boys than among girls of the same nationality. In the Irish group, 31.8 per cent of the boys gave positive reactions as against 25.7 per cent of the girls; in the Canadian group 35.8 per cent of the boys were positive as against 23.8 per cent of the girls; and in the Teutonic group 38.2 per cent of the boys were positive as against 25.1 per cent of the girls.

Different sections of the same city may show a wide variation in the percentage of reactions. It was found in one city of 60,000 population that the number of children reacting to the tuberculin test in different school districts varied from 11 per cent to 60 per cent. Chronic forms of pulmonary tuberculosis such as are found in granite quarry workers, expose and infect more children than the more acute cases who live a much shorter time after the disease becomes infectious. Crowded living conditions afford more opportunities for contact, and congested areas show a higher percentage of infection.—Henry D. Chadwick and David Zacks, The Incidence of Tuberculous Infection in School Children, *New England J. Med.*, 200: 332–337 (Feb. 14), 1929.

Tonsils and Rheumatism—A survey was made of 439 children who had acute rheumatism. The most susceptible ages for the first attack were between 5 and 15 years. Of the 439 cases, 126 had the first attack between the ages of 5 and 10 years, and 239 had the first attack between the ages of 10 and 15. The first attack appeared in 123 of the 439 children who had their tonsils removed, as compared with 316 where the tonsils were still present. Recurrent attacks of rheumatism occurred less often in children who had their tonsils removed after the first attack than in those whose tonsils were not removed. Of the 316 children who had their first attack before the tonsils were removed, 80 had one or more recurrent attacks of acute rheumatism before enucleation of the tonsils and 56 had their second attack after enucleation of the tonsils. Thirty-one of 123 children who had acute rheumatism for the first time after tonsillectomy had recurrences, and 31 of 159 children who had the tonsils removed after the first attack had recurrences. The incidence of carditis as a complication in acute rheumatism was nearly as frequent in children who had undergone tonsillectomy as in those who had not. Forty per cent of 316 children who did not have their tonsils removed, developed rheumatic endocarditis, as compared with 39 per cent of 123 children who underwent tonsillectomy. Chorea occurred as a complication in acute rheumatism with equal frequency

in children operated and not operated on, but the association of carditis with chorea was less in children whose tonsils had been removed. Tonsils are the avenue of infection in many cases of rheumatism and bear a definite relationship to this disease. Their removal should be advocated in the rheumatic and potentially rheumatic child until more is known of the etiology of the disease.—Albert D. Kaiser, The Relation of the Tonsils to Acute Rheumatism during Childhood, *Am. J. Dis. Child.*, 37: 559–564 (Mar.), 1929.

A Setback in Mid-life Mortality—Since 1920 there have been 5 particularly good health years, and 2 that fell below the general average. For the years 1921, 1922, 1924, 1925 and 1927 the crude death rates for the United States Death Registration States were 11.6, 11.8, 11.8, 11.8 and 11.5 per 1,000 population. For the years 1923 and 1926 the crude death rates were, respectively, 12.3 and 12.2 per 1,000 population. The series of expectations of life at birth for the years 1921, 1922, 1924, 1925 and 1927 runs somewhat irregularly as follows: 58.01, 57.89, 58.11, 58.20, 59.10. The corresponding series of figures for the expectation of life at age 5 was 59.37, 58.97, 58.81, 58.54, and 58.78. At age 37 the continuously decreasing sequence is again shown with a series of 32.86, 32.26, 31.98, 31.50 and 31.47. At birth the expectation of life in 1921 was 58.01 as against 59.10 in 1927. But after the first year of life there is practical equality, namely 61.49 for 1921 and 61.48 for 1927. Thus the gain in expectation of life during the 7-year period from 1921 to 1927, inclusive, is secured chiefly by the improvement in infant mortality. From age 37 on there has been an increase in the mortality rates for 1927 as compared with 1921. At age 42 the death rate was 7.61 per 1,000 in 1921 as compared with 8.37 in 1927. At age 52 the death rate was 12.99 in 1921 as compared with 14.68 in 1927. At age 62 the death rate was 26.78 in 1921 as compared with 29.44 in 1927.

For the industrial policyholders of the Metropolitan Life Insurance Company the matter has a slightly different aspect. As they represent essentially the wage earning population, their expectation of life still falls somewhat short of that for the general population. A gain in expectation of life is recorded up to and including age 5, for 1927 as compared with 1921. As compared with 1922, the year 1927 shows a gain in expectation of life up to age 30. But the mortality conditions have been improving only at the younger ages of life. —*Stat. Bull.*, Met. Life Ins. Co., 10: 1–4 (Feb.), 1929.

Mortality in Childbirth—At the present time the mortality rate in childbirth is lowest in those countries where the delivery of normal cases is almost entirely in the hands of the trained midwife. In England with the midwives in charge of only 50 per cent of the deliveries, the mortality rate is higher than in the countries on the continent where midwives deliver 85 to 90 per cent of the cases. In the United States maternity care has been largely in charge of the medical profession. The number of physicians available for care during childbirth is rapidly diminishing, and there is need for nurses and midwives trained to care for normal patients for whom no physician is available. In the birth registration area of the United States, the maternal mortality rate of 6.5 per 1,000 live births has remained practically the same for the past 20 years. In the southern states of this country inadequate care among the colored women is largely responsible for the high death rate. The average maternal mortality rate in the cities for 1927 was 7.5 per 1,000 live births, as compared with a rate of 5.5 in rural

districts. The death rate from puerperal septicemia was 3.1 per 1,000 live births in the cities, as compared with 1.9 in rural districts. The lower death rate for rural districts may be due to less interference with labor, and a reduction of infection associated with operative deliveries. Puerperal septicemia is the cause of over 40 per cent of maternal deaths, and eclampsia the cause of more than 25 per cent. Almost 20 per cent of deaths are due to accidents of pregnancy and labor which could be greatly reduced by proper supervision.

About 40 per cent of the births in this country are in the hands of midwives, and over 90 per cent of these women are untrained. During the past 10 years the New York State Department of Health has been active in improving the practice of the midwife, and as a result the number of midwives has been greatly reduced. In 1916 midwives reported 16.13 per cent of the total births, as against 7.09 per cent in 1926. In 1911 a school for midwives was established in connection with the maternity service at Bellevue Hospital. The midwives at the school have delivered 13,762 women since 1911. One hundred and thirty-three of the cases were transferred to Bellevue for hospital care. There were 11 maternal deaths, and 4 of these occurred among the cases transferred to the hospital. The maternal death rate was 0.75 per 1,000 live births; the stillbirth rate was 1.77 per cent; and operative delivery by forceps was 2.32 per cent.

As a result of state registration of midwives and on account of restricted immigration, the need and demand for midwives will rapidly decrease except possibly among the rural colored population of the South. Prenatal care would increase the number of normal deliveries and lessen the number of operative deliveries. Furthermore, the standard of maternity care would be greatly improved if the number of properly organized maternity hospitals could be increased, and if maternity services were established in local general hospitals for the care of abnormal obstetrical cases.—Frederick W. Rice, The Problem of Reducing Mortality Associated with Childbirth, *New York State J. Med.*, 29: 262–267 (Mar. 1), 1929.

Suicides in Budapest—A comparison of figures relating to the rate of suicides in Budapest shows that the rate was lower in prewar years than it has been in postwar years. The number of suicides was 334 per 1,000,000 inhabitants in 1874; 462 in 1910–1913; 357 in 1914–1918; and 505 in 1923–1927. Prior to the war 68 per cent of the suicides were men, and 32 per cent were women. For the period 1923 to 1927, 57 per cent were men and 43 per cent were women. The numerical increase of suicides was in young women and in old people of both sexes. From the point of view of religions, the number of suicides is lowest among the Roman Catholics, next among the Jews, and highest among the Protestants. From the standpoint of occupation, suicides are most prevalent among those having an uncertain existence, among merchants, those dealing with credit business, and craftsmen's assistants. Among women, domestic servants and pensioned widows are to the fore. High suicide indexes such as exist in Budapest are found also in Berlin and Dresden.—Suicides in Budapest and in the Large European Centers, *J. A. M. A.*, 92: 999 (Mar. 23), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Drinking Fountains—The drinking fountain has not received as much attention from public health officials as its widespread use warrants. Several years ago the Minnesota Department of Health studied this subject and published its findings in *Public Health Reports* for May 11, 1917. More recently, that department has deemed it of value again to draw to the notice of the public the fact that not all types of drinking fountains are satisfactory. This was done through the adoption of the resolution given below:

WHEREAS, public drinking fountains have largely replaced the common drinking cup and are provided in a great many places accessible to the public, and

WHEREAS, investigations have shown that disease producing bacteria may be transmitted from one person to another through the use of improperly constructed or improperly operated drinking fountains, and

WHEREAS, the observations made by the State Board of Health have revealed the presence of insanitary types of drinking fountains in many public and semi-public places throughout the state, therefore be it

RESOLVED that the attention of the public be drawn to the fact that not all drinking fountains are satisfactory and that to be sanitary, drinking fountains should conform with the following general requirements:

1. The jet of water emerging from the fountain should be slanting so that discharged water does not fall back onto the surface.

2. The orifices from which the water emerges should be protected in such manner that they cannot be touched by the lips or be contaminated by droppings from the mouth or by splashings from the base beneath the orifices, and

3. An adequate supply of pure water, under sufficient pressure, properly controlled, should be provided in order to insure satisfactory operation of the fountain.

Significance of Bacteria of the Coli-Aerogenes Group in Drinking Water; Two Possible Sources—American biologists have found that organisms of the coli-aerogenes group are divisible into two subgroups by their reactions to four tests, and have suggested that the coli subgroup is derived mainly from animal intestines, while the aerogenes subgroup occurs commonly in soil and water. The distinguishing tests are: (1) the high ratio of carbon dioxide to hydrogen in the gas evolved from cultures of the aerogenes subgroup in dextrose broth (Clark). Methyl red is consequently colored red by growth of coli subgroup, yellow by aerogenes. (2) The formation of a red color when 5 c.c. of 10 per cent caustic potash is added to a 4-days Clark culture of aerogenes subgroup and incubated for a further 24 hours. Coli subgroup does not give this color (Voges-Proskauer reaction). (3) and (4) The growth of aerogenes subgroup in liquid mediums containing uric acid (Koser) and sodium citrate (Koser-Simmons) respectively. In both cases the coli subgroup is inhibited. The authors carried out comparative tests on 510 cultures isolated from natural waters, and 490 cultures obtained directly from human and animal excrement. The standard German method for testing gas production (Eijkmann-Bulir at 46° C.) was followed. The water cultures gave 95 per cent gas formers, the fecal 94.5 per cent. Applying the American tests, the proportions were 96.2 per cent and 95.9 per cent. By both methods the presence of *B. aerogenes* was shown in 1.4 per cent of the water cultures, and in 0.4 per cent

of the others. The American distinguishing tests for coli and aerogenes are superfluous when the Bulir gas forming test is carried out at 46° C. and this gives strong evidence of intestinal origin of a strain of coli.—Minkewitsch, Trofimuk, Wedenjapin at the Acad. Mil. Med. Leningrad, *Ztschr. f. Hyg. u. Infectionskrankh.*, 109: 348, 1928. (From papers of Water Pollution Research Board, England.)

Biological Purification of Town Sewage in Sewage Fish Ponds—A description is given of the sewage fish ponds of the "Mittlere Isar A.—G" in Munich which are almost completed. Their function is to purify biologically the sewage from Munich, which has already been mechanically clarified. The ponds cover 233 hectares, and consist of 30 large ponds for breeding carp, and other smaller ponds for hatching. The total production, exclusive of tench, which also breed, is about 100,000 kg. of carp, and the gross yield per hectare of tank-surface is estimated at 1,000 R. M.—A. Schillinger, Paper read before Meeting of Verein deutscher Chemiker, *Chem. Ztg.*, 52: 481, 1928. (From papers of Water Pollution Research Board, England.)

Size of Pores and the Mechanism of the Berkefeld Filter—A description is given of some experiments to discover whether the mechanism of the Berkefeld filter depends solely on straining or is partly due to the adsorption force exerted on the bacteria by the diatomaceous earth. The method was to determine the maximum and average size of the pores and compare the result with the size of bacteria. The existence of some adsorption mechanism would be proved if the pores were the larger. The size of the largest pores was ascertained by measuring the pressure necessary to drive air bubbles through a cylinder filled with water, and calculating the value from Einstein's formula. The average size of the pores was found by noting the quantity of water passing through the cylinder in unit time at unit pressure, and calculating the value from Bechhold's formula. The majority of Berkefeld filters in use were found to have an average pore size of about 2 μ, which would only retain bacteria to the size of 1 μ, showing that their efficacy is due to an adsorption mechanism. Owing to this, it is possible to choose comparatively big pores for these filters, without making them permeable to germs, and thus give them a high productivity.—H. Hock, *Chem. Fabrik.*, 645, 1928. (From papers of Water Pollution Research Board, England.)

Causes and Prevention of Hydrogen Sulphide in Abattoir Sewage—Details are given of an investigation at Sydney arising from hydrogen sulphide formation, with consequent corrosion, in concrete sewers carrying abattoir effluents. The installation of a plant to recover part of the suspended solids failed to eliminate the trouble. The time of decomposition, as measured by the discoloration of lead acetate paper, of mixtures of ½ per cent of blood in salt solution with varying quantities of dissolved and suspended proteins, was found to be 4 to 10 days, as against 1½ hours in the sewers. It was suggested that putrefying paunch contents, delayed in passing from the by-products works to the sewers, inoculated the fresh material—a view supported by the fact that at laboratory temperatures the time of decomposition was in one instance 24 hours, against 1 hour at 37° C. Cultures from paunch were made on agar containing ferrous sulphate, and dark-stained colonies indicated the presence of an organism producing hydrogen sulphide, subsequently identified as *B. coli communis*, which was found to be associated with the coarser solids in paunch. Abattoir discharges during the night were of such

a temperature as to provide optimum conditions for bacterial growth; a cooling system was therefore introduced, and hydrogen sulphide fixed by treatment with iron, with sufficient lime to inhibit multiplication of organisms. The authors conclude that the desiderata for gas elimination are: maximum removal of solids; avoidance of delay in discharge to sewers; cooling of effluents, and sterilization of plant when shut down.—A. B. Porter and J. A. Cresswick, *J. Soc. Chem. Ind.*, 47: 380T, 1928. (From papers of Water Pollution Research Board, England.)

General Review of the Studies of Plankton of Large Rivers—In this article are collected the results obtained by numerous workers from studies of plankton in rivers in France, Great Britain, Germany, Austro-Hungary, Italy, Spain, Switzerland, Sweden, Russia, Asia, Africa and America. The author correlates this information in the second part of the article which deals with the characteristics of plankton in rapid flowing rivers. A comparison is also given of the phytoplankton of the Loire and of rapid flowing rivers.—J. des Cilleuls, *Internat. Rev. d. ges. Hydrobiol. u. Hydrograph.*, 20: 174, 1928. (From papers of Water Pollution Research Board, England.)

Interesting Features of Audubon Park Natatorium, New Orleans, La.—Twin pools from 3′ to 9′ in depth, a separate pool 40′ x 80′ for children, an ornamental concourse around the pools, a dry moat and fence outside the concourse, pressure filters, chlorine dosing apparatus, pumps, lighting system, two bath houses each 30′ x 214′, roadways and parking place for 600 cars, comprise this natatorium which was constructed at a cost of $250,000, of which $90,000 was the cost of the pools.

Automatic safety valves permit ground water to enter the pools when they are nearly empty, thus relieving the pressure on the underside of the floor. Twin pools permit the cleaning of one pool while the other is in service. The usual dangerous pipe ladder is replaced by notches forming steps in the concrete wall, and a hand rail which does not reach to the water. The filter capacity is 100,000 gallons an hour. Alum is used as a flocculent. Bath houses are provided with lockers, dressing rooms, private showers, and a passage 35′ long provided with a barrage of showers and 6 inches of flowing water for cleansing the feet for a pool entrance. Careful inspection of bathers and water inspections are made.—William Scheppegrell, *Am. City*, 39, 4: 129–130 (Oct.), 1928. Abstr. S. H. Smith.

Pollution of Tidal and Non-tidal Waters—The author gives a general review of the causes and effects of pollution in tidal and non-tidal waters. The general effect of all pollution is to degrade or to destroy normal life in the affected stream. It may supplant or supplement normal flora and fauna by other organisms and may render the stream incapable of supporting fish life. In this connection reference is made to the work of Butcher and Pentelow on the River Lark.

With regard to the effects of pollution on the dissolved oxygen content of streams, the author quotes Adeney's work on the aeration of water and gives limiting rates for the absorption of air by water at different temperatures. In non-tidal streams the effects of pollution only manifest themselves below the point of discharge, but in tidal waters the reversal of flow produced by the tide causes pollution to travel both above and below the point of entry and retards the escape of effluents from the river. On the other hand, it tends to stir up matter which otherwise would accumulate on the bottom and ferment,

giving rise to a nuisance. The main effect of pollution on fish life is the reduction of the dissolved oxygen in the water.

A study of the oxygen requirements of fish has shown that the dissolved oxygen in the water of salmon and trout streams should not be allowed to fall below 70 per cent saturation or below 50 per cent for other fish. The author concludes with a discussion of the law with regard to river pollution and gives his views as to the duties which should be carried out by river authorities responsible for the diminution of pollution.—J. H. Coste, *Tr. Soc. Chem. Ind.*, 47: 133, 1928. (From papers of Water Pollution Research Board, England.)

Production of Milk of Low Bacterial Content by Means of Milking Machines—An Alfa-Laval milking machine, typical of most modern machines, was used with two milking units. One unit was washed, brushed, and rinsed in water at 185° F. after each milking; in the other all rubber parts were washed, brushed and sterilized by steam for 10 minutes at 210° F. after each milking. Disinfectants were not considered because "as used in practice they are not to be compared in efficiency with less expensive sterilization by steam."

Plate counts showed enormous fluctuations with both units. After other possibilities were eliminated, the contamination was found, by means of a suspension of carmine, to be due to small quantities of water in the vacuum pipe line finding their way into the receiving pails. By turning all vacuum supply taps upward, giving a generous slope to each section of the vacuum pipe line, and providing drain cocks at each low point, leakage was eliminated, and excellent results followed. Of 191 samples of 28-hour old milk examined for each unit over a period of 1 year, the sterile unit showed 173 below 10,000 per c.c. and 190 below 200,000 per c.c.; while for the washed unit 151 were below 10,000 per c.c., 167 were below 200,000 per c.c., and 20 were over 500,000 per c.c. The average keeping quality of milk at 60° F. was 96 hours for the sterile unit and 86 hours for the washed unit. In machines from which test cup liners are readily removed, steam sterilization is successful, without seriously shortening the life of rubber parts.—A. T. R. Mattick and F. Procter, *J. Hyg.*, 27, 2: 215–224 (Jan.), 1928. Abstr. A. W. Fuchs.

Bacterial Examination of Water in Public Swimming Baths—The author reviews the literature of transmission of disease by swimming baths and of bacterial standards. Practically all of the standards considered are of United States origin.

Experimental results obtained from a number of places in England during 1925–26 are given. These data include bacterial results, methods of operating the bathing pools, number of persons using baths and effects of temperature.

The author concludes in part that: (1) Pollution is less in cold weather than in warm, regardless of methods; (2) continuous filtration is superior to occasional emptying and filling with fresh water; (3) standard adopted should be as stringent as that for drinking water (U. S. Treasury), and (4) it is not possible to maintain this standard without continuous disinfection with some agent such as chlorine.—G. K. Bowes, *J. State Med.*, 36, 9: 521–545 (Sept.), 1928. Abstr. C. T. Butterfield.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Relation of Illumination to Ocular Efficiency and Ocular Fatigue—The office of Industrial Hygiene of the U. S. Public Health Service announces the publication shortly of *Public Health Bulletin No. 181,* which is devoted to a study of the relationship of illumination to ocular efficiency and fatigue.

This study was made during the period 1924 to 1926, in the main post office of Chicago. The purposes of the study were to determine the degree of illumination under which the distribution of mail might be made with the greatest ease and efficiency; to demonstrate ocular fatigue and determine its relation to different degrees of illumination.

In order to rule out the effects of the mental attitude of the worker and the effects of variations in the amount of work on hand, the sorting of small letter mail by the night shift received much attention. In this case, it was found that there resulted an increase of approximately 8 per cent in sorting speed when the illumination was increased from 2.7 to 10.7 foot candles.

In a series of tests, where 1,000 specially prepared cards were used as the test mail, it was found that the time to read the addresses on the cards decreased 8 per cent when the intensity of illumination was increased from 2.5 to 10 foot candles.

The studies of the effect of the degree of illumination upon ocular fatigue showed that visual acuity improved after the subjects had worked under high illumination for a sufficient length of time, and decreased correspondingly after working under low intensities of illumination. This is, unquestionably, a very important significant finding.

Studies on refractive errors indicate the incidence of these defects to be rather high. Fifty per cent of the clerks wore glasses.—*Pub. Health Rep.,* 44, 8 (Feb. 22), 1929. L. G.

French Experience Regarding Occupational Diseases Caused by X-rays and Radio-Active Substances—The first signs of exposure to these radiations consist in blood changes, wherein: first, the numbers of white blood corpuscles and then the red blood corpuscles are altered. The first of the white blood changes consists in a reduction of the leucocytes. Later, this is followed by a decrease in the number of red blood corpuscles, at which time these are characterized by inequality of size and shape. There is also a lowering of arterial pressure, but, nevertheless, no disturbance of the cardiovascular equilibrium. There may be changes in the reproductive organs, producing sterility and disordered menstruation. Finally, there may be disturbances of nutrition, characterized by loss of weight and other subjective symptoms. Locally, there may be traumatic effects resulting in radio-dermatitis, burns and lesions of the skin and underlying tissues.

The protective measures, recommended by the French Academy of Medicine, consist in adequate ventilation of work places, the use of rubber gloves and of forceps for handling of the materials, protection from the rays by plates of metallic lead and periodic medical and blood examination of the workers. The radioactive substances considered as injurious include the following: radium, radium emanation, radioactivity induced by radium or radon,

polonium, actinium, thorium, mesothorium, and radiothorium, thorium X, emanation of thorium, or thoron, and radioactivity induced by uranium, and its salts, uranium X, and ionium.

The following types of industrial processes were considered potential sources of poisoning from these substances: Plants for the extraction of radioactive elements from minerals, manufacture of derivative radioactive substances; plants making medical appliances for radium therapy, or X-ray appliances; laboratories for research or measurement of radioactive substances and X-rays; plants making radioactive chemical or pharmaceutical products, and factories making radioactive luminous products or workshops in which these paints are applied; clinics and sanatoriums, centers for the treatment of cancer; enterprises for the sale of radium and radioactive substances; and manufacturing establishments using X-rays.—Abstr., *Month. Labor Rev.*, 28, 1: 77 (Jan.), 1929. L. G.

Road Tar Poisoning—This contribution presents the report of the case of a workman, aged 30, employed as a tar wagon tender, engaged in highway construction.

In the usual fashion, the tar was melted in a roadside oven, but was allowed to flow from the tank by some passing school children. The worker in question waded through a considerable body of tar and finally succeeded in closing the spigot.

Later, during the same day, the worker was carried to a hospital, shortly after becoming violently ill and experiencing convulsive seizures. It was found that marked pulmonary edema was present, as were also superficial burns of the mouth and upper respiratory tract. After one week in the hospital he was discharged, but shortly after developed a severe hemorrhage from the respiratory tract. From this time on, he presented a condition of multiple hemorrhage, nephritis, anemia and general emaciation, followed later by neurasthenic and hysterical symptoms.

The symptomatology associated with the nervous system continually increased and, finally, resulted in an abnormal mental state, as well as paralysis of the right leg.

Coal tar is the residue after coal tar distillation is complete. It consists of a number of complex organic materials among which are phenols and naphthalene.—*J. A. M. A.*, 92, 9: 695 (Mar. 2), 1929. L. G.

Compensation for Silicosis—The British Home Office has now abruptly abandoned its plan of extending compensation for silica to one industry at a time and has instead issued a comprehensive draft scheme for granting compensation for death and total disability in practically every occupation in which a silica risk is present.

It is important to note that under this new plan workers in the initial stages of the disease are not entitled to compensation. Compensation should be awarded only for total disability or death, but it is the plan to study each industry for the purpose of linking up preventive procedure with compensation award.

To the abstractor, this appears to be a most rational and commendable step in the study and mitigation of occupational diseases. It would be well if we, in the United States, would follow such procedures.—*Month. Labor Rev.*, 28, 1 (Jan.), 1929. L. G.

Pneumonokoniosis from Sand Blasting—This paper presents a detailed examination of 26 men employed in the process of sand blasting. In 16 cases pronounced X-ray findings were found. In 2 of these tuberculosis and pneumonokoniosis were found, in 2 tuberculosis without pneumonokoniosis, and in 10 silicosis was found, 7 of which

presented changes of very marked extent.

The duration of exposure in all cases was relatively short: in 1, 8 years; in 1, 6 years; in 2, 4 years; in 1, 3 years; and in the remainder less than 3 years. Of the workers the older ones presented more marked evidence of injury.

Physical signs were comparatively slight in spite of the fact that in many cases the X-rays showed advanced disease. Chest expansion was apparently a good index, being poor in most cases.

Four of the 26 workers died shortly, and 4 others who were examined at a later period showed marked extension of the pathological process.—E. V. Müller, *Zentralb. f. Gewerbhyg.*, 5: 148 (May), 1928; Abst., *J. Indust. Hyg.*, Feb., 1929, p. 36. L. G.

The Etiology of Silicosis—There are five milestones to our present attitude toward this disease: (1) Agricola in the 16th century pointed out that there were two kinds of injurious dust, one non-corrosive and the other corrosive; (2) Alison, in the early part of the 19th century, established the association between dust-phthisis and tuberculosis (or tubercles); (3) Zenker, in 1867, showed that lung pigmentation was directly due to inhaled particles; (4) Collis, in 1915, insisted upon the importance of free silica, SiO_2, and that in industry no other dust was of importance in dust-phthisis; and (5) McCrae, just before Collis's lecture, announced that the particles of free silica found in the lungs were under 9 microns in diameter as a rule; and about the same time Watkins-Pitchford noted the same.

Two types of silicosis are now recognized, one uncomplicated, and the other complicated, by an infective process of which the most common is tuberculosis. The tissue cells concerned in both processes belong to the same cell system, i.e., the "lymphatic cell" of Calmette. Gye and Kettle, and the writer, have advanced the view that the behavior of silica dust is related to its slow solubility in the tissues, citing 7 facts to support this. The minute size of the particles, the resulting phagocytosis, the concentration of dust, duration and conditions of exposure are the factors determining dust-phthisis while pigmentation is not characteristic of free silica, but is due to carbon inhaled as smoke or dust.

So-called "miners' phthisis" means superimposed infection on the fibrosis already set up and favors acute pneumococcal or streptococcal infections as well as tuberculosis. Guinea pig experiments show that silica dust remains in the lungs up to the time of death, but coal dust will have practically disappeared in an equal time. (Discussion of the forms of clinical silicosis follows under the headings of silicosis, tuberculo-silicosis, and silico-tuberculosis.)

Experiments show that it is difficult to infect animals with dry tubercle bacilli, even when associated with dust, but it is easy to produce inhalation infection with microörganisms suspended in droplets of water. "Two hours' summer sun may kill a culture of *B. tuberculosis*. The bacilli may, however, survive up to 10 days in dry dust exposed to a poor light. They may remain virulent for months in wet mud or garden soil." Hence, conditions in mines favor the viability of the tubercle bacillus, as it has been noted that water particles may occur in the proportion of 150 to every dust particle.

Furthermore, Calmette points out that water particles from 2 to 15 microns in diameter are respirable and may remain in suspension in the air up to 7 hours. Therefore droplet infection is possible and the ideal conditions for the same obtain at least in the Witwatersrand mines.

Light and dryness are the enemies of the tubercle bacillus—conditions which do not exist in these mines. Silico-tuberculosis is only met with in those

dusty trades that use water for dust laying. Coal miners (colliers) work in dry surroundings and therefore have no silico-tuberculosis. While the inhalation route may be the common path of tuberculous infection in dusty trades, the use of water for dust prevention is not an unmixed blessing, for while it hinders the dust factor it facilitates the tuberculosis factor. Furthermore, droplets facilitate the entry of dust particles. This may explain the comparatively disappointing results by the use of water in mines to reduce air-borne dust. It is, however, at present the only available method for dust laying in many trades and its use has been followed by a decrease in pneumonokoniosis.

The use of ventilation in coal mines has eradicated pneumonokoniosis, not the use of water. Hence, a phthisis-producing industry depends not only upon the inhalation of dust but upon conditions which favor inhalation infections and super-infections with the tubercle bacillus.

"Tuberculosis is an environmental disease rather than an infectious disease in the ordinary sense." Conditions in some industries favor "case to case infection and super-infection and the inhalation route is suggested as a common route (dust-phthisis is proverbially non-infectious in the home)." Infection may be unimportant in ordinary tuberculosis, but it does not follow that it is an unimportant factor in silico-tuberculosis. "Dr. Louis Irvine, Chairman of the Miners' Phthisis Medical Bureau, has been watching our silicosis for 25 years, and he tells me that the variety he now sees is becoming more and more like ordinary chronic fibroid phthisis. Professor E.-L. Collis gives me similar information based on his experience with the disease in Great Britain." It is probable that certain metallic dusts may modify the disease, judging from the studies of hemochromatosis, and while silicosis is predominantly nodular in distribution, it is likely that the drier the working conditions, and the less soot present, the greater the part played by the interstitial process.

Experts will, at the first glance, recognize the disease, at the second, the industry, and at the third, the district. Engineers are always asking how much dust it takes to produce miners' phthisis and how much is inhaled in a unit of time; but it is difficult to explain that individuals vary in their ability to deal with dust, so that the dust sampling apparatus will not tell how much dust is retained nor its endangering effects. As Haldane points out, "Man is not a machine" (nineteen pages of discussion follow).—J. Mavrogordato, *Rapports*, IV^e Reunion de la Commission Internationale Permanente pour l'Etude des Maladies Professionnelles, Lyon, 3–6: 1–23 (Avril), 1929, Société Anonyme de l'Imprimerie A. Rey, 4 Rue Gentil, 4.

Report of South African Institute for Medical Research—This report discloses some interesting experimental work conducted with asbestos dust. Apparently the pathological changes produced in animals were similar to those produced in workers, the time element, however, being longer. Amorphous silica dust apparently produced a fibrosis out of proportion to the quantity of dust present, suggesting that this is perhaps more readily soluble than certain other forms of silica.

Routine studies on tuberculin reactions of individual mine workers have been conducted. So far, however, only one death from tuberculosis has occurred among those who gave a positive tuberculin reaction.—*Annual Report of the South African Institute for Medical Research for the year ended 31st December, 1927*, Dept. Indust. Hyg., pp. 28–31, Johannesburg, 1928. Abstr. *J. Indust. Hyg.*, Feb., 1929, p. 40. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Nutritive Value of Milk. I. The Production of Nutritional Anemia in Albino Rats through Exclusive Whole Milk Diets—As a step in the study of food value of milk, rats were fed exclusively whole milk diets. Milk from three groups of Holstein cows on very different rations was fed to three groups of rats. With two exceptions all rats grew well for 3 weeks; growth then slowed, and stopped after 6 weeks. Rats then maintained their weight for several weeks, after which there was decline and death. Anemia was present and was confirmed by post-mortem examination. Another group of rats was fed mixed milk from an entire herd of Holsteins and Jerseys, with the same results. Hemoglobin determinations on rats on an exclusive milk diet for 11 weeks showed between 2 and 3 gm. of hemoglobin per 100 c.c. compared with 15 to 16.5 gm. per 100 c.c. for normal rats. In attempting to eliminate the dietary anemia by supplementary feeding, a number of procedures were studied, to be presented in a subsequent paper. The only success in correcting the anemia was by the use of specially prepared yeast, hog liver, or solutions of iron and copper fed simultaneously. The procedure is described for determining the preventive or curative power of the test substances by means of hemoglobin determinations on the blood of the test animals.—W. E. Krauss, *J. Dairy Sci.*, 12: 74 (Jan.), 1929.

Nutritional Value of Copper in Powdered Whole Milk—Young rats, 25 to 27 days old, were fed whole milk powder supplemented with cod liver oil. Weight and hemoglobin determinations were made weekly. Growth curves and hemoglobin determinations are shown for animals receiving whole milk and those receiving whole milk plus iron. Those on the whole milk diet failed to grow and were anemic, while those on the iron supplement showed good growth and hemoglobin production for a period of 10 weeks. The powdered milk contained about 0.0006 per cent copper due to the solvent action of the milk on the copper evaporating pan. It is contended that the presence of minimal amounts of copper may be beneficial instead of detrimental in spite of what has been written on the deleterious effect of copper in milk and the steps taken by manufacturers to eliminate traces of this metal. Work of other investigators is cited to show the favorable effect of small amounts of copper in nutrition.—R. W. Titus and J. S. Hughes, *J. Dairy Sci.*, 12: 90 (Jan.), 1929.

Relative Food Values of Brown (from "Entire" Wheat Grain) and White (from Endosperm of Grain) Wheaten Flour, and Their Comparative Potency for the Prevention of Xerophthalmia in Guinea Pigs—A slight superiority of whole wheat flour over patent flour in its content of vitamin A has been shown in a series of feeding experiments conducted on guinea pigs. In the general discussion of the relative value of brown (whole wheat) and white (patent) flour, it is emphasized that both flours are deficient in a number of essential nutritive factors, but that these deficiencies are not significant when the diet is liberal and varied. The difference in content of vitamin A is thought to be of signifi-

cance only when the diet is extremely restricted, as when it consists largely of bread supplemented by margarine, jam, and perhaps fruits. Under these conditions whole wheat flour should be recommended in place of white flour.—(E. J. Sheehy, *Roy. Irish Acad. Proc.*, 37 (1927), Sec. B, No. 27, pp. 415–425)—Abstract, *Exper. Sta. Rec.*, 60: 394 (Mar.), 1929.

Association of Vitamin A with Greenness in Plant Tissue. II. The Vitamin A Content of Asparagus—Previous experiments (Abstract, *A. J. P. H.*, Nov., 1927) on the vitamin A content of head and leaf lettuce suggested the possible variation in this vitamin in green and bleached asparagus tips. Bleached tips were secured by covering rows with soil and cutting the stalks before emergence from the surface. Fresh, cooked, and canned asparagus, both green and bleached, were fed to albino rats which had been depleted in vitamin A by preliminary diet, and growth determinations were ascertained over a period of 8 weeks. Chemical analyses of the asparagus, and growth curves on the various diets, are given.

Fresh asparagus in daily amounts of 0.1 gm. was fed throughout one experiment, and the fresh bleached asparagus was fed in the same amount except in one experiment where it was increased to 0.5 gm. The result was an average gain of 20 gm. and no deaths on the fresh green asparagus, while on the bleached, health and weight declined and all animals were dead at the end of the 5th week, whether on 0.5 gm. or 0.1 gm. The daily ration of cooked asparagus was 0.1 gm., both for the green and white products. Animals fared better on the cooked product and there was not such a difference between the green and the bleached, but animals on the latter fared better than on the fresh bleached. Canned asparagus, blanched 3 minutes, packed in cans, sealed and processed for 25 minutes (at 10 lb. pressure), was fed in 0.1 gm. daily doses for the green, and 0.2 gm. daily for the bleached. Animals on canned green asparagus recovered and made good growth, but those on the canned bleached asparagus declined and died at a rapid rate after the 2d week.

The authors point to the possible correlation between the depth of chlorophyl and the vitamin A content, although there is no evidence that the two are identical. It is also concluded that the inadequacy of bleached asparagus as food may not be due alone to vitamin A deficiency, but to deleterious chemical compounds, since cooking in an open kettle improved its nutritive value to some extent. Chemical analyses showed that the green tissue was lower in water and iron than the bleached, but higher in ash, nitrogen, sulfur, calcium, and phosphorus.—John W. Crist and Marie Dye, *J. Biol. Chem.*, 81: 525 (Mar.), 1929.

Vitamin A, B, and C Content of Artificially versus Naturally Ripened Tomatoes—The increased commercial use of ethylene in the ripening of fruits and vegetables prompted this investigation to determine the effect on the vitamin content of tomatoes. Tomatoes grown under inspection were picked when the " green mature " stage was reached. These were divided into 3 lots, one fed as picked green from the vines, the second ripened at room temperature, the third treated with an ethylene-air mixture. A fourth lot consisted of tomatoes ripened on the vines. The ethylene-air mixture, approximately 1: 800, was passed over the tomatoes in a bell jar provided with inlet and outlet tubes.

Rats, 40 to 50 gm. weight, were used for testing vitamins A and B, and guinea pigs, 6 to 8 weeks old, for vitamin C. In testing for vitamin B (the complex) the basal diet, casein, starch, butterfat, lard, salt mixture, was supplemented

with cod liver oil. Four gm. daily, for a period of 8 weeks, of green tomatoes, air ripened tomatoes, ethylene-air ripened, and vine ripened tomatoes were fed respectively to four groups of rats, the average daily consumption being practically the same for all groups. Growth curves show no great differences for any of these groups and the uniform gain in weight seems to warrant the conclusion that the amount of vitamin B complex did not differ in green tomatoes and those ripened artificially or naturally. The basal diet used for determining vitamin A content was irradiated to insure a supply of vitamin D.

At the end of the vitamin A depletion period, animals, at an average weight of 122 gm., were divided into 4 groups and fed as in the test for vitamin B, the amount being 2 gm. of tomatoes per animal per day. Positive controls were given 10 drops of cod liver oil daily. Here the growth curves indicate no material difference between the groups, although rats on the green tomatoes gained materially less weight than the others. The data here indicate the same amount of vitamin A in ripened tomatoes, whether by natural or artificial means, and an amount somewhat less in green tomatoes. Guinea pigs, after a preliminary diet to insure adequacy of vitamin C, were divided into negative and positive controls, the latter being given 3 c.c. of canned tomato juice daily. Four groups were fed daily 4 gm. of the 4 lots of tomatoes. Animals were weighed twice a week and autopsies performed at the end of the experiment. Positive controls showed no scurvy and negative controls severe scurvy. Guinea pigs on green tomatoes showed definite symptoms of scurvy; incipient scurvy appeared in some of the animals on the ripened, and air ripened, tomatoes but there was no difference between the two groups, both being superior in health to the group on green tomatoes. Guinea pigs on the vine ripened tomatoes were in the healthiest and best condition with no indication of scurvy. The authors conclude that tomatoes ripened by ethylene are equivalent to tomatoes ripened in the air so far as the vitamins A, B, and C are concerned.—Margaret C. House, P. Mabel Nelson, and E. S. Haber, *J. Biol. Chem.*, 81: 495 (Mar.), 1929.

Antirachitic Factor in Burbot Liver Oil—The burbot fish, sometimes called "lawyer fish" or "eel pout," is the nearest fresh-water relative of the cod, but is used for fertilizer and seldom for human food. The average fish weighs 3 lb. while the liver is alleged to be 6 times as large as that of any other fish of inland waters. One liver used in the experiment weighed 0.55 lb. The percentage of oil secured varied from 36 to 56. Because of the announcement by previous investigators that the liver of this fish probably contained antirachitic vitamins, this study was undertaken. Fresh livers were cooked under pressure and the oil which rose to the surface was skimmed and used in this experiment. Rats on a ricketogenic diet for 21 to 23 days were given for 10 additional days the diet supplemented with the burbot liver oil or cod liver oil, after which they were chloroformed and the antirachitic action measured by the "line test" technic. Varying percentages of the supplementary oil were added, from 2 to as low as 0.007. A table of results shows that 2 per cent cod liver oil ration was required for complete healing as against 0.125 per cent burbot liver oil. The 0.5 per cent cod liver oil and 0.06 burbot liver oil gave comparable results. With 0.03 per cent cod liver oil there was no healing in 3 cases and slight in 2 cases, but the same percentage of burbot liver oil showed good signs of healing. Two rats on the 0.007 per cent burbot liver oil were comparable to those on 0.06 per cent cod liver oil. Results indicate a potency in burbot liver oil about 8 times

that of cod liver oil, although there is doubt if this is due to inherent properties of the oil or variations in the individual samples, in view of recent work in which the potency of cod liver is shown to be in inverse ratio to its oil content. (*Proc. Soc. Exper. Biol. & Med.*, 25, 653 (May), 1928).—Bertha Clow and Abby Marlatt, *Indust. & Eng. Chem.*, 21: 281 (Mar.), 1929.

Effects of Massive Doses of Irradiated Ergosterol—Several investigators have shown the effect of small doses of irradiated ergosterol, but the study of large doses of vitamin D has been impossible because of impurity until the development of the irradiated ergosterol. Rats averaging 50 to 70 gm. were fed the low phosphorus rickets-genic diet for 4 weeks and rickets was confirmed by autopsy. The animals were put in 3 groups, one exposed to reflected daylight, the second given in addition 2 per cent cod liver oil, and the third, a solution of irradiated ergosterol in oil, containing from 20,000 to 100,000 times the necessary curative dose daily. The experiments lasted for 1 month, with weighings at weekly intervals. At the end of the experiment all animals were autopsied and blood analyses made. The animals fed irradiated ergosterol lost weight, suffered anorexia and general physical impairment. Growth was less than in either of the other groups, and the blood calcium concentration was 50 per cent higher than the controls. Bones of all animals appeared healed. The results indicate the possibility of harm by the use of excessive doses of irradiated ergosterol in rachitic animals. —Irwin J. Klein, *J. A. M. A.*, 92: 621 (Feb. 23), 1929.

Possibility of Infection from Bacillus Botulinus—This editorial recites the present known facts on *B. botulinus* and the possibility of its causing infection. Botulism is caused by toxins produced by types of *B. botulinus* developed in understerilized preserved foods. Because of the resistance of the spores the problem of adequate sterilization is important. The question as to the possibility of the germination of spores in the animal body has been investigated by Coleman and Meyer (*J. Infect. Dis.*, 31: 644 (Dec.), 1922), who found evidence of such germination in the closed jugular vein in laboratory animals. Recently with the use of formaldehyde to debilitate tissues, 25 spores inoculated intramuscularly grew and produced poison. Geiger showed that botulinus toxin was absorbed from fresh wounds with symptoms and death from botulism. In spite of the experimental evidence, no reports are available of human botulism from spore-contaminated wounds. It is suggested that public health officials should insist that spoiled food be destroyed and not consumed even after boiling. Such advice seems to be supported by the known wide distribution of *B. botulinus* as a soil organism.—Editorial, *J. A. M. A.*, 92: 563 (Feb. 16), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

The Baffling Problem of Maternal Mortality—One of the most baffling and distressing problems with which he has to deal, according to Mr. Chamberlain, the English Minister of Health, is maternal mortality. Speaking recently in connection with a mother saving campaign, he pointed out some of the efforts which are being made to promote maternal and child health in England and the lack of success in certain directions.

England spends annually out of public money about 10 million dollars on maternity and child welfare services. Voluntary agencies, in addition, spend large sums. Yet the maternal mortality shows no significant change. The total infant mortality has dropped during the last 22 years from 132 per 1,000 live births to 65. Mr. Chamberlain, with a restraint worthy of emulation by some public health workers on this side of the ocean, does not claim that this drop has been due entirely to child welfare activities, though he does think that the latter played a considerable part.

The maternal mortality, on the other hand, has remained almost stationary for the last 20 years or more, any tendency to change being in the upward direction. It appears extraordinary to the Minister of Health—as indeed it does to all thoughtful observers—that this condition should persist despite all the advances made in recent years in medical science and all the effort and money expended on antenatal and postnatal clinics, the training of midwives, and on propaganda generally. One of the obvious reasons for the maternal mortality is puerperal septicemia which as yet is often not preventable.

An interesting and hopeful statement made by the minister was to the effect that he had initiated an inquiry into the circumstances of every current maternal death, a study which would be carried on by a committee of experts. The interest of local authorities and the medical profession has been enlisted in the gathering of data.—London Letter, *J. A. M. A.*, 92, 13: 1136.

The Washington (D. C.) Child Research Center—In these days of belief in early health education it is interesting to hear of such a venture as this. The purpose of the Research Center, as stated, is " the experimental investigation of normal and problem children, with emphasis upon the development of the preschool child." Classification of the work is quoted in full:

1. Study of the training of preschool children
2. Study and treatment of problem children under 10 years of age
3. Parent education by means of individual conferences, lectures, group conferences, study classes and directed reading
4. Directed observation and study of preschool children by students in home economics
5. University classes in child development for undergraduate and graduate students
6. Coöperation with institutions caring for children in outlining their programs

A few of the problems studied so far —the center began work February, 1928 —are the incidence of colds in preschool children and effect of exhibition of hexyl-resorcinol upon their prevention; effect of muscle training upon flat feet and posture; influence of activity (play) and personality upon the duration and character of afternoon sleep, etc.

A parent education program is being

developed, which certainly seems a step in the right direction. Few "problem" children are unaccompanied by "problem" parents and this appears to be largely due to our inadequate educational methods.

Technical articles, popular pamphlets and a book, *The Process of Human Behavior*, are some of the publications of the center to date and will doubtless have much of value for all interested in the "neglected age."—Mandel Sherman, M.D., Ph.D., *Child Health Bull.*, Jan., 1929.

Mental Hygiene in the Public Schools—How mental hygiene may be made available and practical in our school systems is a question of great interest. Ira S. Wile, M.D., says:

Mental hygiene is a term that is frequently misunderstood as referring primarily to the problems of mental defectives. Wherever there is mentality, there is necessity for mental hygiene; wherever there are schools, mental hygiene exists; but there is considerable difference between mental hygiene that is helpful, constructive and effective and that which is poor, inadequate and disadvantageous.

Mental hygiene is merely the science and the art of preserving mental health and of preventing mental inadequacy from any and every cause, so far as may be possible.

It is patent that public schools cannot escape the implications of responsibility contained in this form of definition. *Who goes to school?* The child. He goes with his body, his mind and his soul. The entire child is at school.

Whether desired and purposed or not, every element that is placed into a school system has a positive, neutral or negative value for mental hygienists.

The school systems must recognize that all children are not cast in the same mold. The school has been wont to dwell upon intellectual deficiencies without adequate recognition of emotional disturbances. The average school program of today, in the light of our present knowledge, is unbalanced, because it is insufficiently influenced by the principles that are known to affect the personality of school children.

The child at school is in a dual position. He is his unit self and again he is a unit of any one of a large number of groups, such as his own class, several different departments and the school as a whole. The variations between individual desires and group demands afford abundant opportunities for emotional distresses and conflicts.

It is time to begin the consideration of mental hygiene, then, in its widest educational implications. As I view the subject, mental hygiene is inherent in every problem of education.

Dr. Wile makes certain suggestions as to a state program for mental hygiene within the school system:

The normal school for the training of teachers is a place of vital importance. Here the teacher should learn the organization of children's educational systems and their emotional reaction systems. She should have training in the purpose and interpretation of psychological testing and in methods of remedial teaching, and an appreciation of the specialized classes.

She should gain insight into her own difficulties. The personality of the teacher in the class room is always important. The unhappy teacher just "holding down" her job may do infinite harm.

It is important that the teacher see the mental hygiene potentials in the situation; the effect of success and failure, demotion, skipping a grade, failure in arithmetic, lax room discipline, etc.

Dr. Wile feels that a mental hygiene clinic available to the schools is a basic need. He suggests that on entrance to school each child be placed in a "clearing class" from which he should later be graded after study and size-up with the help of a visiting teacher; and further, an adjustment clinic made up within the school to study disciplinary matters. Discipline should not be punishment; it is guidance rather than a painful mandate. The offence should be viewed as symptomatic and its origin sought.

The combination of a clearing class, visiting teacher, and adjustment clinic would provide for the reasonable introduction of a constructive mental hygiene program into the public school system without great cost. Such a plan could be utilized in cities, large or small, and could be of great service without elaborate organization.—

Ira S. Wile, M.D., Mental Hygiene in the Public Schools; *Mental Hyg.*, XIII, 1: 70–80 (Jan.), 1929.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Post-Graduate Courses in Public Health Nursing—The Education Committee of the N. O. P. H. N. has continued studies of courses in public health nursing, and the report for the past year indicates that there are at present 11 courses in public health nursing meeting the approval of this committee and having the minimum requirements of "a qualified nurse director, affiliation with a school of collegiate grade, a budget, and academic year program with correlated didactic and field instruction."

In studying and grading the various schools, the aim of the committee has been to observe fundamental principles and leave the courses free to develop beyond that, as desired and as indicated by local needs.

Development of instruction and experience in mental hygiene, health education, school nursing and rural nursing are increasing. Some schools have received increased financial support. Closer coöperation between nursing departments and other departments in the colleges is being brought about. Efforts to correlate theory and practice continue to be made with varying degrees of success.

Seven of the 11 schools are connected with a 5-year university nursing program. The number of students enrolled in the schools and their academic and professional qualifications are steadily increasing, but progress would be brought about more rapidly if public health nursing agencies, particularly official health and educational agencies, would demand better qualified nurses.

The work of the Education Committee is to be greatly assisted in the future by the appointment of an educational secretary.—Gertrude E. Hodgman, Post-Graduate Courses in Public Health Nursing, Report of Education Committee of the N. O. P. H. N., *Pub. Health Nurse,* XXI, 2: 93 (Feb.), 1929.

Rural Public Health Nursing Teaching Centers—In the rural field, there is a need for more and better trained public health nurses, which is baffling rural public health nursing supervisors everywhere. Even in the 11 approved schools, the facilities for rural training are too limited to provide training for the rural nurse. Many must still be content with the experience secured on a city staff, however inadequate it may be in preparing them for the different psychological, administrative and health problems of the rural territory.

To meet this situation, certain rural training centers have been developed in different parts of the country without any particular plan of organization. About 8 of these have been studied, and the conditions in them present considerable variation. Some of these centers are under the direction of the state health departments in Alabama, Mississippi, Ohio and New York; some are rural fields used for experience of students in schools of public health nursing in Minneapolis, Minn., Cleveland, O., Richmond, Va., and Nashville, Tenn. Most of them have been selected because of convenient location; some because of good organization.

Advisory public health committees, which are recommended as essential to good administration by the A. P. H. A., were found to be functioning with varying degrees of success in some of the

places studied, while others had no such guidance.

The desirable length of time a student should remain in such a field is agreed to be about 2 months following appropriate theoretical courses, but actually the student's experience has varied from a few days to a few weeks. Much needs to be done to balance the student's experience and teaching in the essentials of office routine, community organization, child hygiene, contagious disease control, sanitation, clinics, group teaching and health education. Of course, much of the success or failure of these training centers will depend upon the personality and professional qualifications of the supervising nurse as well as the preparation of the students.

On the financial side, if the teaching program is well developed, it is sometimes found that students are an expense to the county organization, which must be met in some way. At present, in many instances, the students are receiving some salary for the service which they render during their period in the field.—Pearl McIver, Rural Public Health Nursing Teaching Centers, *Pub. Health Nurse*, XXI, 2: 72 (Feb.), 1929.

Guaranteed Annuities for Nurses—How shall we provide for the time when we are no longer able to follow our profession? This question has been one of the most perplexing in relation to nurses, and especially those engaged in private duty nursing. Inability to count on a secured income very far in advance because of irregular employment has prevented many private duty nurses from tying up their funds in large premium payments involved in the ordinary annuity policy.

A method of saving regularly in small amounts, in order to have an income in the later years of life, is one answer to the question and the solution to the problem for many nurses. The Harmon Association, 140 Nassau Street, New York, N. Y., has announced an annuity plan whereby registered nurses may deposit small sums monthly during their working careers and be assured a monthly income on reaching retiring age.

The fund is to be administered by the Harmon Association for the Advancement of Nursing, lately incorporated, and gifts may be made to the association by persons interested in swelling the annuities for nurses. A nurse may make a deposit according to her circumstances and when ready to retire may cease making payments and receive a monthly guaranteed income as long as she lives.

The plan has been endorsed by the officers of national nursing associations, representing about 100,000 nurses, and is similar to one worked out for teachers by the Carnegie Foundation for the Advancement of Teaching.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Dates Ahead—An encyclopedic help for those who wish to give a timely touch to publicity material or to plan events of timely interest is "Anniversaries and Holidays: A Calendar of Days and How to Observe Them," by Mary E. Hazeltine. American Library Association, Chicago, Ill., 1928. It lists birthdays of notable people, holidays, saints' days and other special occasions with information sources for many of them. Gorgas, Koch, Lister, Osler, Reed, Trudeau, and others are there. Numerous selected references are offered on amateur dramatics, pageantry, costumes, and so on. One method of use is to pick the man or the event you wish to use—in press releases, in a meeting, etc. Another possibility is to find the man or the event of interest to some organization in your community and propose some use by that group in which you can tie up some health message. *Price, $6.00.*

The Labor Blindness Prevention Campaign—An official letter from President William Green of the American Federation of Labor says:

As was announced to the New Orleans Convention, the American Federation of Labor has worked out with the National Society for the Prevention of Blindness a practical plan for a campaign to conserve eyesight. This plan includes the preparation of educational material and literature which will be printed in the *American Federationist* or in other labor papers.

The society is also prepared to send speakers to address labor bodies and meetings on the various phases of eye conservation. It considers this educational campaign of such great importance that it is willing to pay the expense of sending one of its officers or members of its executive staff to address special meetings of labor organizations where the educational effect will be far reaching. It would be necessary to allow at least 30 minutes for the address, and the speaker must be given a prominent place on your program. Of course, requests for speakers must be made far enough in advance to make possible the necessary travelling as well as to fit in with the itinerary of the various speakers. The National Society will also be glad to send to conventions of state federations or meetings of other large local groups sight conservation exhibits. It will also supply, without charge, a set of four large industrial posters with fliers. The society will also make available to unions selections from its collection of 500 stereopticon slides, charging only for transportation both ways and replacement of broken slides.

This coöperative project offers the possibility of numerous tie-ups for the alert state or local health agency. Write National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y.

Displays at San Francisco and Minneapolis—Classified displays of publicity and educational material will be features at the headquarters of the Social Work Publicity Council at San Francisco, Calif., June 26 to July 3. Especially for the sake of any Pacific Coast health workers who may not get to Minneapolis in October, it is hoped that many health items will be sent for display, and that health will be well represented in the prize awards for annual reports, feature stories, news photographs, posters, radio talks, and Sunday magazine articles. For details address the Council at 130 East 22d St., New York, N. Y.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

The President Recognizes Public Health—Several departments and other health agencies have quoted from President Hoover's inaugural address:

In public health the discoveries of science have opened a new era. Many sections of our country and many groups of our citizens suffer from diseases the eradication of which are mere matters of administration and moderate expenditure. Public health service should be as fully organized and as universally incorporated into our governmental system as is public education. The returns are a thousandfold in economic benefits, and infinitely more in reduction of suffering and promotion of human happiness.

"Do Not Kiss Me"—The baby bib has been enlisted for health propaganda by C. V. Craster, M.D., Newark, N. J., health officer. Bibs bearing these words, "Please Do Not Kiss Me—I Do Not Want to Get Sick," are sent to the mothers of new-born infants. It is a striking way of getting an idea over to mothers, and "it has given the mother a method of insisting on her baby's protection without incurring the hard feelings of her friends." Newspaper publicity has been widespread. A picture of the bib appeared in Hamburg, Germany. Letters have come to Dr. Craster from many cities in the United States and Canada from mothers, health officials, teachers, social workers and others. Sample from Department of Health, Newark, N. J., for 10 cents. Quantities with name of your department or association from Walsh Hospital Supply Co., Lincoln Park, Newark, N. J. 1,000 for $85.00.

Denver Survey Recommendations—The following recommendations for popular health education appear in *An Appraisal of Public Health Activities in Denver, Colorado:*

1. That, based on the needs outlined in connection with this study, a program of popular health education be planned, which will include as completely as possible the recommendations made by the committees dealing with the specific health activities, to the end that a well-rounded program may be undertaken and carried out.

2. That, since the newspaper is the most important medium for conveying information to the public, plans be worked out for the more general and regular use of the newspapers as a means of securing wide dissemination of information on health matters.

3. That, in addition to a more liberal distribution of pamphlets and bulletins on health, arrangements should be made for the establishment of a Speakers' Bureau, so that there will be available at all times some persons who are well qualified to speak on subjects relating to Public Health.

Specific recommendations for educational activities appear under "Venereal Disease Control," "School Hygiene," "Food and Milk Control," and "Heart Disease Control." A big job is laid out. There are no budgetary or personnel recommendations. Published by Denver Public Health Council. 50 cents.

Classification of Printed Matter—According to *Postage and Mailbag:*

If you will classify the various physical kinds of direct-mail according to their outstanding capabilities, they will fall definitely into these four groups:

1. *Continuity* (good will), house organ, mailing cards, booklets, pamphlets, package or letter inserts
2. *Action* (sales, inquiries), letters, all kinds, broadsides, self-mailing folders, unbound folders
3. *References* (information, data), catalogs, books, portfolios, maps, blue-prints
4. *Reminder* (name, location, business), blotters, calendars, post cards, novelties

Having this classification in mind, if you will decide what it is your proposed piece is to accomplish, you will have little trouble locating the format in one of these groups.

A "Hunch" for Editors—The following from *Editor and Publisher* (Mar. 23, 1929) might interest one of your local editors:

Those news editors who find their hospitals a difficult source of news might follow the example of a paper which recently carried a series of Sunday features describing one such institution each week, its history, et cetera,

illustrated with the cut of the present building, the superintendent and the head physician. The series supplied not only interesting reading matter but established good will with several important news contacts.

When a Governor Speaks—Governor H. H. Horton, of Tennessee, stated several major objectives of the State Department of Health in urging favorable action on the proposed budget of the department. The department will supply a copy of the statement.

HOUSE ORGANS

One of few house organs with a real community coverage, except the one so long issued by the Brookline, Mass., Department of Health, will be *Health News,* "Bellevue-Yorkville's Picture Newspaper." The first issue (see under "Diphtheria") was followed by one on tuberculosis. It is proposed to publish *Health News* monthly, with 40,000 copies to be delivered by a distributing concern. Copies of the first 5 issues will be sent as they appear for *25 cents* Address Marjorie Dent Candee, 325 East 38th St., New York, N. Y.

"Facts Taken from the Annual Report of Buffalo of 1857," in *Sanitary Bulletin,* Buffalo Department of Health, suggests interesting copy for use in many other cities.

Modern Health Crusader, 209 College St., Burlington, Vt., now appears in magazine size, with a stiff paper cover. "High School Revue" is a new idea for a special department.

SCAA News, New York, has been "dressed up" with new type—to increase attractiveness and readability.

Yours for Health is the new 4-page multigraphed monthly of the Racine Department of Health, taking the place of the former weekly mimeographed bulletin.

The *News Letter* of Dutchess Co. Health Assn., 16 Cannon St., Poughkeepsie, N. Y., goes monthly to 475 "doctors, nurses, board and committee members, supervisors and other good citizens of the country." The March, 1929, issue tells about the work done in getting out the *Letter* and asks readers to answer seven questions.

Will those who have asked readers what they thought about their organ, or what readers wanted to read, please report?

CAMPAIGNS

"To stimulate state-wide activity in child health improvement, the Indiana Child Hygiene Division is devoting 6 weeks to the initiation of health projects which will culminate on May Day." Details in *Monthly Bulletin,* Indiana State Board of Health, Jan., 1929. An elaborate program of possibilities. Includes questionnaire covering: health inventory, family, home, child, school.

"Putting On a Health Week," by E. O. Chimene. *Hygeia.* Mar., 1929. How Austin, Tex., did it. With organization chart.

SCHOOLS AND CHILDREN

"Danny Dentin in His Barrel" is a simple, home-made device invented by Neva Bushong, La Grange County (Indiana) nurse, to encourage correction of dental defects. Two sketches of "Danny" in *Echoes,* Indiana State Board of Health, Jan., 1929. *Free.*

Did you read "Candy—A School Health Problem" on page 69 of *Hygeia,* Jan., 1929, and also "Stalking the Food Faddist" by the Sugar Institute, on page 97?

For public and private schools having classes in French, pamphlets and other health material might be secured at reasonable rates from the Association de Propaganda pour la Protection Medicale et Hygienique de la Mere et de l'Enfant, 4, rue de Sevres, Paris, France. Price list upon request.

From the Shenango Valley Community Fund comes a story form which suggests possible uses by health work-

ers. "The Twins' Adventures in 'Heart Land'" opens as follows:

Jack and Marie were called "the Melville twins" by all who knew them. They were always (1) together, this brother and sister of (2) years.

"What shall we do today?" asked Marie of Jack, one (3) day in (4).

"Well," said Jack, "I see that the Community Fund is going to hold its annual campaign (5)."

On the last page are "Definitions of the Words to Put in the Blank Spaces," for example: (1) Viewed; (2) One dozen; (3) Not dark; (4) Tenth month of the year; (5) Fourth Monday in October to fifth Monday.

"The many requests received in our School Health Bureau indicate the need for definite and detailed descriptions of successful school health programs," says the Metropolitan Life Insurance Company. The response took the form of "A School Health Study of Newton, Mass." 88 pages. *Free.*

PUBLIC SPEAKING

"Whom Shall We Have as Speaker?" is the new list of topics and speakers offered to the public by the Speakers' Bureau of the Community Chest and Council of Social Agencies, 312 West 9th St., Cincinnati, O. Health topics are listed under "Health Programs and Problems," "Health Instruction," "Child Health," "Mouth Hygiene," and "Mental Hygiene." Some topics: "Next Door to Trouble" (by Chief Sanitary Inspector); "The Watchman at the Gate" (Chief Food Inspector); "Youth and Life and Commonsense" (Advisor for Girls, Woodward High School); "Fashions in Health" (Public Health Federation); "Beauty Products" (Nutrition Worker); "Tooth Truths" (Public Dental Service Society). Copy for *4 cents.*

Does the above prompt you to propose that a similar list be issued by the local chest or council of social agencies, or the group of local health agencies?

"A Public Speaking Clinic," in *Woman's Journal*, New York, N. Y. (Feb., 1929), describes a class and clinic conducted by a Los Angeles woman's club. To an increasing extent civic, social and health agencies are conducting classes or holding clinics in public speaking.

EDUCATION NEEDED

"The remedy for the menace of the quack in this field ('female cures'), as in all the other fields of quackery, is education. Women are gulled not because they lack intelligence but because they lack knowledge."—In "Female Weakness Cures," by A. J. Cramp. *Hygeia.* Mar., 1929.

HONORABLE MENTION

To California Department of Health: For detailed table of contents in Biennial Report.

To Pasadena, Calif., Health Department: For an annual report with an index, and an organization chart of the Department.

DO THEY NEED EDUCATION?

Note to teacher from parent: "If that nurse comes to school today to stick the children, send my children home. They wear asafetida to keep away diseases."—Reported by Nolan County, Tex., nurse while conducting a diphtheria campaign.

NEW PERIODICALS

Human Biology, Baltimore, Md., edited by Raymond Pearl.

Red Cross News, Toronto, Ont., organ of Canadian Red Cross.

Social Science Abstracts, Fayerweather Hall, Columbia University, New York, N. Y.

BOOKS AND REPORTS

Getting Ready to be a Mother—*(2d ed. rev.) By Carolyn Conant Van Blarcom, R.N. New York: Macmillan,* 1929. 286 pp. Price, $1.75.

This manual for mothers is a handy little volume, well printed on good paper and with many excellent cuts. The first edition appeared in 1922.

A book like this is presumably of most use to well-to-do, educated women. It would seem rather "highbrow" to the prospective mother with a grammar school education only. Furthermore—to give the unfavorable criticisms first—the book goes into too great detail in places, especially for the patient who is going to take the excellent advice given of engaging a physician early and following his directions. It is a question how much value there is to the amount of anatomy and embryology incorporated into chapters three and four. A little knowledge is often not only dangerous but upsetting and leads to morbidness, only too common during pregnancy. Again, the dietary advice in the later chapters is somewhat complicated and unduly restrictive.

It seems rather unwise to retail contradictory recommendations: it weakens the force of all. One should either lay down definite rules or else leave it to the physician to do. The fact that some physicians are said to advise so and so and others the opposite, leaves the poor patient, like the ass in the fable, not knowing which way to turn. Powdered milk is damned openly on page 196 and faintly praised on page 197, rather without justification in the light of more recent studies. Pasteurization, too, is treated in rather stepmotherly fashion.

One is a bit surprised to find little or no reference to the part that the visiting nurse may play as contrasted with the nurse who devotes her whole time to the one patient. There might be, with advantage, a little greater stressing of the vast importance of attention to diet during the prenatal period if the baby is to have proper teeth.

On the whole, the book is a most useful one and justifies its continued popularity. Its shortcomings, few in comparison with its strong points, have their roots in a desire on the part of the author not to trespass on the rôle of the attending physician—a rôle which he too often does not fill to the complete satisfaction of the anxious and inquiring patient.

It would seem that this book might be of value to nurses as well as to the more intelligent mothers, particularly in its chapters on the technic of the baby's toilet, and to most physicians too.

MERRILL E. CHAMPION

A Doctor's Letters to Expectant Parents—*By Frank Howard Richardson, M.D. New York: Norton,* 1929. 118 pp. Price, $1.75.

This series of letters is well written with an eye to answering the questions, spoken and unspoken, which trouble most prospective parents, fathers as well as mothers. It was a fine human touch to address some of the letters to both mother and father. The preface to the book rightly stresses this feature as more or less unique, as is also the emphasis laid on the psychological side of pregnancy—in many cases, quite the most important aspect.

Health departments more and more are using such letters to prospective mothers. The great difficulty they find is in preparing letters intelligible to the

less educated and yet not trivial in the eyes of the educated. Dr. Richardson evidently appeals to the latter class only; from the point of view of the purveyor of popular health literature his letters are decidedly "highbrow." On the other hand, they carefully avoid anatomical and physiological details which are unessential to the lay reader.

Certain especially good points may be referred to: a good talk to parents on the need of forbearance; another on the frank recognition of the drawbacks of pregnancy, both physical and emotional; "maternal impressions" is sensibly handled. There is sound advice about preparing the other children in the family for the coming of the new baby. Breast feeding, as one would expect from Dr. Richardson, is well handled.

One or two minor criticisms might be made. A little more detail might well be gone into concerning a well rounded diet. A rather unduly strong impression is left regarding the danger of attending to the mother's teeth late in pregnancy. Hospital care gets a little too much praise in view of statistical evidence of unfavorable mortality experience in hospital cases. The author runs up against the dilemma, inevitable when one physician gives advice to another physician's patients, of saying too little or too much: if he does not go into detail, the patient may not be told some essential things; if he does, he may be giving advice with which the family physician will disagree, leaving the patient wondering which is right.

On the whole, this little book will bring confidence and satisfaction to many a mother—and father, as well.

MERRILL E. CHAMPION

Children's Behavior and Teachers' Attitudes—*By E. K. Wickman. New York: Commonwealth Fund,* 1928. 247 pp. Price, $2.00.

The far-seeing public health worker is taking an active interest in the literature of mental hygiene and the problems of education. That many health programs (in the broadest sense) have failed in dealing with children of school age, has been due to lack of background on these two fields.

The present book is a very striking contribution to the literature of both mental and school hygiene (again used in a broad sense). Why do teachers consider certain pupils perfect blessings and other pupils, with different characteristics, the precise opposite? The truth is that teachers seem to set up standards of behavior which best meet their own comfort and happiness. That they favor the quiet, well behaved, even timid child would be obvious. On the other hand, the qualities of success seem to lie to a considerable extent in the very aggressiveness, or "attacking" personality, which teachers find disturbing to their discipline and displeasing to their personal preferences. That much good human material is lost through failure to recognize the seriousness of the "withdrawing" type of personality, and that such children are potential hermits unless changed into good social assets; loses prominence through the insidious peacefulness of the school situation created by the withdrawing types of pupils. Nor will the "tiger tamers" and subjugators get the best results from the "attacking" type of children.

Teachers, more than parents, resist attempts to modify behavior patterns because both their professional pride and their self-respect are involved.

Other blocks to progress among teachers are strong present habits, lack of opportunity to practice new procedures, and strong emotional and social maladjustment to the very problems which arise to distress adults in the behavior of children. The teacher's whole philosophy of life, every attitude, is reflected in behavior, and many a teacher is maladjusted. The answer is in the

study and treatment of behavior problems of children, with every classroom a laboratory.

The author leaves one with the impression that teachers as a class can scarcely be considered leaders; that they would do well to "cast out the mote" in their own eyes; that they must spend far more time and thought in professional improvement, at least along lines of social adjustment problems. It might be well to contemplate, in a broader view of the situation, just why many teachers are socially maladjusted. Are they so when they enter the profession? or does the profession in some way change them? The reviewer has his own theory based on studies made in New York State some years ago.

At any rate, this report of a well planned and adequately completed piece of research, is worth the careful attention of anyone who is, even in the vaguest sort of way, in contact with public schools—and that means most of us in the health field.

HUGH GRANT ROWELL

Your Teeth—*By Charles I. Stoloff, D.D.S. New York: E. P. Dutton,* 1928. 224 pp. Price, $2.50.

The cover makes a good impression. It looks like last month's contribution of the Literary Guild. Its wide margin and novel-like proportions keep up the illusion.

The title might well be "Your Teeth, Past, Present and Future," for Dr. Stoloff, though he includes the care of children's teeth, is thinking of the reader as an average American adult with a badly crippled dental machine in constant need of repair and possibly replacement in the future. It is perfectly true that practically all of the popular dental literature written to date is concerned with the child and the prevention of dental troubles. Dental health workers who have felt that the present generation was hopeless, dentally speaking, will be startled by the frankness with which Dr. Stoloff presents the opposite viewpoint on this question. It is also true that types of reparative work are seldom discussed by the average "family dentist." Most members of the dental profession have never felt it necessary to outline the advantages and disadvantages of a fixed versus a removable bridge, or a crown versus an inlay. Dr. Stoloff's point of view is well expressed in the following paragraph:

> An astonishing thing about the contemporary dental educational work is the utter lack of information to such unfortunates—and few of us there are who are not included—whose teeth require repairing or replacement, after the prophylactic (preventive) failure of the most rigid prescribed mouth hygiene. Why should there be more mystery about what is deemed good practice in reparative dental work, than what is considered to be good mouth hygiene?

The order in which the author presents his material is somewhat illogical, as the positive side of the picture, including general information on the two sets of teeth, their formation and care, is given before a discussion of treatment, removal and replacement and at the very end of a long description of root canal work, bridges and plates, appears Prenatal Care and the care of the mouth (tooth brushing)! Diet, though mentioned throughout, is formally introduced under Miscellaneous, with Halitosis, X-ray and Cancer.

Many disputed questions are answered by simple, clear-cut but conservative statements.

Much of the matter concerning the preventive side of mouth hygiene will be unsatisfactory to dental hygienists; for instance, the figure of tooth brushing on page 186, which shows the brush moving cross-wise over the teeth; and such advice to mothers, as on page 38: "If any cavity should form have it filled as soon as it is noticed." It is generally agreed that a mother should take her child to the dentist at frequent intervals (three or four months at this

age) whether she notices cavities or not.

The following, page 67, is surprisingly negative:

> Decay starts very frequently on the biting surfaces in the grooves (technically called fissures) because there may be minute cracks in the enamel at such points which make it difficult, or most impossible to clean thoroughly. Due to the frequency with which teeth decay in these fine "fissures" *there are dentists* who advocate drilling them out and filling them even before any visible evidence or sensation gives warning that the teeth are decaying

in view of the fact that the American Dental Association passed the following resolution as far back as 1926:

> RESOLVED, that in the aim to attain prevention of systemic and dental disease—(a) No defect is too slight to receive definite attention. (b) The temporary teeth should receive as much care as the permanent ones in order to promote the proper development of the jaws and head, and to maintain function. (c) Particular care and attention should be given to developmental pits and fissures, whether occurring in primary or secondary teeth, or whether decay is or is not present.

The line drawings are a good feature and will help to make the book useful in clinics and schools as well as in the waiting rooms of dentists, where it most certainly belongs.

ELEANOR G. MCCARTHY

The Bureau of Dairy Industry. Its History, Activities, and Organization—*By Jenks Cameron. Baltimore: The Johns Hopkins Press,* 1929. 74 pp. Price, $1.50.

The fifty or more service monographs of the United States Government issued by the Institute for Government Research have been prepared according to a uniform plan, but they are written by different authors of various capabilities. The style of the writer of this particular monograph often makes the reader wince, for the author seems to suffer the delusion that he must be clever and fill up space with poor puns and esoteric expressions. He mentions the "ultimate ungodly hour of up-betimesism," whatever that means, and informs us that "the case against American cheese was as strong as the cheese itself." He employs words like "sanitational" and "dissemination al" which seem so far to have eluded the dictionary. The editor as well as the author is at fault for such slovenly writing, and incompetent editing is seldom excusable.

Despite the occasionally atrocious style and the careless editing, this small book is packed with useful information about an important federal bureau, and anyone interested in dairy work will find it valuable for reference and even perusal. In addition to the historical account of the development of the bureau and its activities, there is a description of its organization, and also appendices giving laws, financial facts, and other useful data. The book contains a good index and a fairly adequate bibliography. It is well printed, though one g l a r i n g error, "sport" when "spore" was meant, got past the editor and typographer. JAMES A. TOBEY

The Harvey Lectures—*Delivered under the auspices of the Harvey Society of New York, 1927–1928. Series XXIII. Baltimore: Williams & Wilkins,* 1929. 280 pp. Price, $4.00.

The Harvey Lectures have deservedly won their place in medical literature. The present volume is no exception to the high standard which has been consistently maintained. It contains eight lectures, all giving comprehensive reviews of important subjects. More of them concern new problems and methods than has been usual in the past. An address on Harvey given at a dinner in commemoration of the 300th anniversary of the publication of his epoch-making work is included. Only one of the lectures—that on tularemia—is of direct public health interest. All, however, are important and of unusual excellence.

The printing and make-up of the book are good. M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Darke County, O.—This county health unit functions under a coöperative arrangement whereby the expenses involved are shared by the general district board of health, the city of Greenville, the State Department of Health and the Rockefeller Foundation. A total of 29,547 services were rendered, of which 19,707 were in the county area, and 9,840 in the city. Nursing home visits numbered 6,162, including, among others, prenatal, maternity, infant, preschool, tuberculosis, school and communicable disease visits. There were 9,877 services rendered by the inspection division.

Sanitary and health surveys were completed in 6 incorporated towns and in the 20 townships of the general districts. Every house in the city of Greenville and the 18 incorporated towns, and every farmhouse in the county was visited. In conjunction with the county unit, a training station for health workers has been maintained throughout the year by the Rockefeller Foundation and the State Department of Health. For every $100 spent from tax funds in the county district, 56 cents were spent by the Board of Health. The total expenditures for the year by all agencies amounted to $35,900, including expenses for the maintenance of the training station.

Lincoln, Neb.—Lincoln's 1928 report indicates certain changes in organization of a progressive nature. The child welfare bureau and pediatric clinic have been placed in the hands of a deputy superintendent and pediatrician. A general clinic is in the hands of a deputy superintendent and only those patients above 14 years of age are there treated. Tuberculosis patients are treated in both the pediatric and general clinics. A public health and obstetrical nurse have been added to the health staff. On the basis of a population of 70,000, a birth rate of 13.2 and a general death rate of 12.3 were recorded.

Walla Walla, Wash.—The annual report of the city and county health department for the year ending May 31, 1928, indicates a population of 28,130, a birth rate of 14.01, and a crude death rate of 13.21, with an infant mortality rate of 44. The average age at death for the year was 57. During the year, 57 per cent of the births and 42 per cent of the deaths occurred in hospitals. A card index is kept of all communicable diseases, and of the vaccination and diphtheria immunization records of each public school pupil.

The Commonwealth Fund—Appropriations totalling $2,083,622 were made by the Commonwealth Fund last year in furthering a wide range of public health, mental hygiene, child welfare and educational activities, according to its tenth annual report. Modern fifty-bed hospitals have been awarded to 5 communities since the beginning of the Fund's rural hospital program, for which $358,438 was appropriated during the year. The first of these was opened in Farmville, Va., in November, 1927. The institutions in Glasgow, Ky., and Farmington, Me., will be completed this spring, and those in Beloit, Kan., and Wauseon, O., will probably be opened before the end of 1929. According to the report:

> The rural hospital program is an experiment in social organization involving much more than a building project; it is an effort to attack from a fresh angle the difficult problem of medical and public health service in small towns and the open country, and to change

community standards in respect to the care of the sick, the prevention of disease and the protection of health.

Typical of the general program is the work now going on in the district of 9 Virginia counties served by the Farmville Hospital. The State Health Department has organized this territory into a single unit with a district health officer, under whose leadership a comprehensive health service is being gradually developed. Two medical institutes have been held, with clinical demonstrations and lectures on chosen topics. Ten local physicians have been awarded fellowships for brief postgraduate courses at well-known medical centers. The hospital itself is proving its usefulness to the community and has been operated under the direction of the local Board of Trustees on a gratifyingly high standard. As with all hospitals constructed under the Fund's cooperative program, a third of the cost of the building and equipment and the entire expense of administration have been assumed by the local community.

Experience in carrying on for the past six years a program for the development of child guidance clinics and visiting teacher service in the public schools has brought the conviction that the greatest present need in this field is the adequate training of sufficient personnel. The Fund's chief contribution toward meeting this need has been the Institute for Child Guidance, opened in New York City, July 1, 1927, and now in its second year of operation as a clinic and training center. The student group now includes 7 psychiatrists, 5 psychologists, and 44 psychiatric social workers who are specializing in work with children. For several years the Fund has assisted in a program for the development of child guidance clinic work in England. A special service and training clinic will be opened in the spring of 1929 under the auspices of the Child Guidance Council of Great Britain.

The program of five-year demonstrations of child health work which the Fund undertook in 4 American communities is drawing to a close. The work in Fargo, N. D., was completed at the end of 1927 and full reports of the results have been published during the past year. The demonstrations in Rutherford County, Tenn., and in Athens and Clarke County, Ga., ended in December, 1928. The work in Marion County, Ore., is entering upon its final year. Local appropriations and arrangements for carrying on all essential activities at their own expense have been made in these communities. In Rutherford County, particularly, the report finds " an outstanding example of the possibilities in public health created in a rural community by an awakened public conscience."

On July 1, 1929, the Fund expects to complete the program of child welfare and public health work in Austria which it took over in 1921. The various child health stations will be continued by the Austrian authorities, a new emphasis is being placed upon the adequate training of personnel, and the whole program promises to be successful beyond the hopes that were entertained when the work was begun.

Among the 43 special grants made by the Fund for public health, mental hygiene, and miscellaneous welfare projects during the year, the following may be noted: to the American Public Health Association for the study of public health programs in rural areas; for fellowships in psychiatry at the Boston Psychopathic Hospital, the Henry Phipps Psychiatric Clinic at Baltimore, and the University of Colorado Medical School; to the National Conference of Catholic Charities for a study of child caring homes; to the Boy Scouts of America for a study of the effects of scout work in a number of American cities; to the New York Tuberculosis

and Health Association for cardiac research; and to the American Forestry Association for a program of education looking toward the conservation of forest resources in three southern states.

Orange County, Calif.—This county has an area of 800 sq. mi. and an estimated population of 135,000, according to the 1928 report. The school population of the territory registers 21,387. A general death rate of 8.9 and an infant mortality rate of 73.5 are reported. Heart disease was the cause of death in 1 out of 5 instances.

Present-day preventive medicine is recognizing that it has a nation wide problem in heart disease, and is trying to meet this problem by urging upon the public frequent and regular physical examinations in the physician's office and at school, in order that heart maladies may be found early and perhaps remedied or at least protected from strain before a permanent injury has resulted.

During the year 3,992 complete courses of toxin-antitoxin were administered, 10 per cent being among preschool children. There were 16 cases of typhoid fever, but no deaths. A tuberculosis death rate of 73.8 per 100,000 population is noted. Sixty-nine new cases were reported during the year. Fourteen diagnostic clinics were held, and 468 examinations were made. Thirty-four patients are hospitalized in the new tuberculosis pavillion at the County Hospital and 29 under-nourished children are in attendance in the all-year health camp and preventorium maintained in the Santiago Canyon by the County Tuberculosis Association.

BOOKS RECEIVED

THE HUMAN FACTOR IN INDUSTRY. By E. P. Cathcart. New York: Oxford, 1928. 105 pp.

THE LAWS OF PENNSYLVANIA RELATING TO SOCIAL WORK. Compiled by John S. Bradway. Philadelphia: Public Charities Association of Pennsylvania, 1929. 261 pp. Price, $2.50.

TUBERCULOSIS AND HOW TO COMBAT IT. (2d ed.) By Francis M. Pottenger. St. Louis: Mosby, 1928. 275 pp. Price, $2.00.

THE PHYSICAL WELFARE OF THE SCHOOL CHILD. A Textbook in School Hygiene and Health Work in the Schools for Normal Schools and Colleges. By Charles H. Keene. New York: Houghton, Mifflin, 1929. 505 pp. Price, $2.40.

COMPARATIVE NEUROLOGY. By James W. Papez. New York: Crowell, 1929. 518 pp. Price, $6.00.

PRACTICAL CLINICAL LABORATORY DIAGNOSIS. (3d ed.) By Charles C. Bass and Foster M. Johns. Baltimore: Williams & Wilkins, 1929. 187 pp. Price, $7.50.

HANDBOOK OF MICROSCOPICAL TECHNIQUE. Edited by C. E. McClung. New York: Hoeber, 1929. 495 pp. Price, $8.00.

MANSON'S TROPICAL DISEASES. (9th ed., rev.) By Philip H. Manson-Bahr. New York: Wood, 1929. 921 pp. Price, $11.00.

YOUTHFUL OLD AGE. How to Keep Young. By Walter M. Gallichan. New York: Macmillan, 1929. 236 pp. Price, $2.50.

NUTS AND CITRUS FRUITS, by Francis C. Owen, and STORY OF THE CITRUS FRUITS, by Ellen M. Ramsay. Dansville, N. Y.: F. A. Owen Pub. Co., 1928. 128 pp. Price, $.72.

HANDBOOK OF BACTERIOLOGY. (2d ed.) By Joseph W. Bigger. New York: Wood, 1929. 452 pp. Price, $5.00.

FIVE YEARS IN FARGO. Report of the Commonwealth Fund Child Health Demonstration in Fargo, N. D. New York: Commonwealth Fund, 1929. 297 pp. Price,

THE BIOCHEMISTRY OF THE AMINO ACIDS. By H. H. Mitchell and T. S. Hamilton. American Chemical Society Monograph Series. New York: Chemical Catalog Co., 1929. 619 pp. Price, $9.50.

THE FACTS OF MODERN MEDICINE. By Francis W. Palfrey. New York: Appleton, 1929. 490 pp. Price, $5.00.

UNITED STATES CONTROLLED OZONE. A Popular Scientific and Engineering Treatment of the Production of Ozone and Its Industrial Application. Bulletins Nos. 50 and 51. Chicago: United States Ozone Co., 1929. 66 pp.

DIAGNOSTICS AND TREATMENT OF TROPICAL DISEASES. (5th ed.) By E. R. Stitt. Philadelphia: Blakiston, 1929. 918 pp. Price, $9.00.

PRACTICAL MILK QUALITY TESTS. Used in a System of Milk Control. By Valdemar Christensen. Cincinnati: Ohio Food and Dairy Laboratory, 1929. 86 pp. Free.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

International Public Health—A report of the session of the International Office of Public Hygiene which includes a consideration of the world-wide aspects of venereal diseases among seamen, yellow fever, plague, and outbreaks of other communicable diseases, infant hygiene, etc.

ANON. Regular Session of the Permanent Committee of the International Office of Public Hygiene, Oct., 1928. Pub. Health Rep., 44, 13: 711 (Mar. 29), 1929.

Health Guidance for Girls—An account of the "Girl's Health Trail" designed to focus attention upon tuberculosis in girls of high school age and to stimulate health habits. The machinery developed to carry out the plan in Wisconsin is described.

ANON. Wisconsin Girls Hit the Trail. Survey, 61, 12: 809 (Mar. 15), 1929.

Cancer and State Medicine—Dr. Bigelow tells of the work of the Massachusetts cancer program and makes it the basis of a plea for the medical profession to join with the health officer in solving the inadequacies of present-day treatment facilities—all done in Dr. Bigelow's inimitable way. It should be read by every health worker.

BIGELOW, G. H. Is the State's Cancer Program State Medicine? New England J. Med., 200, 9: 438 (Feb. 28), 1929.

Venereal Disease in New York—Another incidence study of venereal infection, this time in two counties of New York City (Staten Island and Brooklyn). The remainder of the city is to be reported upon later.

BRUNET, W. M. Venereal Disease Prevalence in the City of New York. Long Island M. J., 23, 2 and 3 (Feb. and Mar.), 1929.

Vitamin B in Infant Feeding—Some substance containing vitamin B should be added to the infant's diet just as orange juice and cod liver oil are added to supply the other vitamins. Wheat-germ sugar is the substance recommended to supply the vitamin B factor. Pity the poor yeast advertiser!

DENNETT, R. H. Routine Use of the Vitamin B Factor in Infant Feeding. J. A. M. A., 92, 10: 769 (Mar. 9), 1929.

Measles Serum—Dr. Ferry reviews the evidence which confirms his belief that measles is probably caused by a pleomorphic streptococcus.

FERRY, N. S. Etiology and Specific Treatment of Measles. Am. J. Dis. Child., 37, 3: 572 (Mar.), 1929.

Cleanliness—Practically a poem in praise of cleanliness, this British paper extols cleanliness of the skin, cleanliness of the air, cleanliness of food and water, cleanliness of soil (including our old friend "effluvia"), cleanliness of dwellings and streets. In conclusion, the reader is informed that it is the true basis of all health conservation.

HILL, A. B. Cleanliness: Is It the Basis of Health? J. Roy. San. Inst., 49, 9: 571 (Mar.), 1929.

Minerals in Nutrition—An excellent summary of the rôle of calcium, phosphorus, sunlight, irradiated foods, ergosterol, and the like, written especially for nurses. The article should be of value to health officials who are concerned with health promotion but who are not conversant with the details of research in nutrition.

KOEHNE, M. The Mineral Requirements of the Body. Pub. Health Nurse, 21, 3: 125 (Mar.), 1929.

The Burden of Heart Disease—Heart disease, in terms of incidence and death and loss of means of livelihood, falls more heavily on the underprivileged man and woman than upon the higher social levels. The burden is greater than in all other diseases except tuberculosis, mental defects and chronic arthritis, and increases with each decade in life from 25 to 65.

EMERSON, HAVEN. Economic Aspects of Heart Disease. Am. Heart J., 4, 3: 251 (Feb.), 1929.

Marriage and Divorce—Health officials will be interested in this statistical summary of divorce, if for no other reason than that they are the keepers of vital statistics. But all will be stimulated by the author's philosophical discussion. One observation is priceless. He says: "The obligation accepted at marriage for better or for worse . . . may be more correctly interpreted as for better or for divorce."

HOFFMAN, F. L. Marriage and Divorce. J. Social Hyg., 15, 3: 129 (Mar.), 1929.

Typhus Fever—A method is proposed for distinguishing the American strain of typhus fever (Brill's disease) from old world typhus. Formerly there was no immunologic distinction between the two forms.

MAXCY, K. F. Endemic Typhus Fever of the Southern United States: Reaction of the Guinea Pig. Pub. Health Rep., 44, 11: 589 (Mar.), 1929.

Typhoid Fever Outbreak—Another typhoid fever outbreak traced to chicken salad infected by a carrier. It was served this time at a wedding breakfast instead of the usual harvest home or church supper.

MINER, H. E., and FORSBECK, F. C. An Outbreak of Typhoid Fever Traced to Chicken Salad Infected by a Carrier. New England J. Med., 200, 9: 440 (Feb. 28), 1929.

How to Reduce Maternal Mortality—The continued high maternal mortality rate, higher in cities than in rural regions, will be lower when we have better obstetrical training for physicians, midwives and nurses, says this author. A more widespread knowledge and a clearer understanding of the importance of proper maternity care is also mentioned.

RICE, F. W. The Problem of Reducing Mortality Associated with Childbirth. New York State J. Med., 29, 5: 262 (Mar. 1), 1929.

Fatigue in Industry—The effect of fatigue upon the health and life of industrial workers and the influence of heat upon fatigue are discussed. The experience is with miners and steel workers in Great Britain.

VERNON, H. M. The Fatigue of Heavy Industrial Work, and Its Influence on the Health and Duration of Industrial Life. J. State Med., 37, 3: 141 (Mar.), 1929.

Irradiated Ergosterol—Another study indicating the value of irradiated ergosterol in the treatment of rickets. A commercial preparation was used and proved to be well tolerated and effective.

WILKES, E. T. The Treatment of Rickets with Irradiated Ergosterol. Am. J. Dis. Child., 37, 3: 483 (Mar.), 1929.

Rats on Shipboard—All about rats, their fleas, and the rat proofing and fumigation of ships.

WILLIAMS, C. L. A Rat and a Rat-Flea Survey of Ships at the Port of New York. Pub. Health Rep., 44, 9: 443 (Mar. 1), 1929.

Glass Transmitting Ultra-violet Light—Experience with two types of glass permitting the passage of ultra-violet rays, "Corex" glass and "Vita-glass," indicated the superiority of the former.

WYMAN, E. T., et al. The Value of Different Types of Glass for Transmitting Ultra-violet Light. Am. J. Dis. Child., 37, 3: 473 (Mar.), 1929.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

THE following universities and technical schools are offering courses in public health and preventive medicine during their summer sessions. While this is not a complete list of schools giving such courses during the summer, it represents those replying to a questionnaire from the American Journal of Public Health and The Nation's Health.

UNIVERSITY OF CALIFORNIA, Berkeley, Calif. July 1–August 10
Social Hygiene
Child Welfare
Health of the School Child
Introduction to Statistical Method
Subject Matter and Technique in the Teaching of Home Hygiene and Care of the Sick
Preventive Medicine
Public Health Nursing
Administration of Schools of Nursing
Supervision in Schools of Nursing

UNIVERSITY OF CHICAGO, Chicago, Ill.
June 17–July 24 (First Term)
July 25–August 30 (Second Term)
Hygiene and Bacteriology
Public Hygiene
Immunity in Relation to Preventive Medicine
Public Health Problems
Sanitary Surveys
Public Health Nursing
School Hygiene
Physical Education
General Bacteriology
The Pathogenic Bacteria
Public Health Laboratory Methods
Parasitology
Epidemiology
Industrial Hygiene (First Term)
Public Health Engineering (Second Term)
Health Education
Personal Hygiene
Physiology of Nutrition
Statistics

COLUMBIA UNIVERSITY—DeLamar Institute of Public Health, College of Physicians and Surgeons, New York, N. Y. June 10–June 28
School Health Supervision
—Teachers College, New York, N. Y. July 8–August 16
Home and Community Hygiene
Child Hygiene
Public Health Administration
Mental Hygiene
Administration of Health Work in Schools
Teaching Problems in Health Education
Methods of Health Education
Public Health Nursing
Methods of Teaching in Sight Conservation Classes
Methods of Teaching Lip-reading to Deafened Children

CORNELL UNIVERSITY, Ithaca, N. Y.
July 6–August 16
Physical Education
Measurements of School Children
Hygiene of the School Child and Adolescent
Health Inspection of School Children
Gymnastics and Dancing

DUKE UNIVERSITY, Durham, N. C.
June 10–July 20 (First Term)
July 22–August 29 (Second Term)
Research in the Organization and Administration of Health Education
Methods in Health Education
Physical Education
Personal and School Hygiene

HARVARD UNIVERSITY, Cambridge, Mass. July 8–August 17
Principles and Problems of Hygiene
Physical Education

UNIVERSITY OF ILLINOIS, Urbana, Ill. June 17–August 10
Organization and Supervision of Health Education in the Elementary Schools
Physical Education

THE STATE UNIVERSITY OF IOWA, Iowa City, Ia.
June 10–July 20 (First Term)
July 22–August 24 (Second Term)
Hygiene
Hygiene of Swimming Pools, Gymnasiums and Camps
Principles of Physical Growth and Measurements
Supervision of Public School Physical Education
Care of Student Health—Physical Diagnosis
Physical Education in Junior and Senior High Schools
Hygiene and Sanitation

JOHNS HOPKINS UNIVERSITY, Baltimore, Md. July 1–August 9
Preventive Medicine and Hygiene
School Sanitation and Vital Statistics

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, Mass. July 1–August 13
Methods of Teaching General Biology
Bacteriology
Health Education Methods
Hygiene of the School Child
Public Health Laboratory Methods
Public Health Institute for Health Officers and Other Public Health Workers

UNIVERSITY OF MICHIGAN, Ann Arbor, Mich. June 24–August 3
General Hygiene and Public Health
School Hygiene
Methods and Materials in Health Education
Child Hygiene
Principles of Public Health Nursing
Organization and Administration of Public Health Nursing
Applied Nutrition
Mental Hygiene
Vital Statistics
Epidemiology
Public Health Administration
Public Health Institutes

MICHIGAN STATE COLLEGE, East Lansing, Mich. June 25–August 2
Medical Biology
Bacteriology
Hygiene

UNIVERSITY OF MISSOURI, Columbia, Mo. June 10–August 2
Physical Education
Nursing

UNIVERSITY OF NEW MEXICO, Albuquerque, N. M. June 3–July 27
The Elements of School Health
Educational Hygiene

NEW YORK UNIVERSITY, New York, N. Y. July 1–August 9
Child Hygiene
Principles of Teaching Health
Methods of Teaching Health

NORTHWESTERN UNIVERSITY, Evanston, Ill. June 24–August 17
Personal Hygiene

OHIO STATE UNIVERSITY, Columbus, O.
June 18–July 24 (First Term)
July 25–August 30 (Second Term)
Child Health
Elementary Nursing
Principles of Public Health Nursing
Public Health Nursing Field Work

OREGON STATE AGRICULTURAL SCHOOL, Corvallis, Ore. June 17–July 26
Health Education
Nutrition
Child Care Laboratory
Physical Education
School Health Problems
Mental Hygiene
Social Hygiene Education

UNIVERSITY OF PENNSYLVANIA, Philadelphia, Pa. July 1–August 10
Hygiene
Physical Education

PENNSYLVANIA SCHOOL OF SOCIAL AND HEALTH WORK, Philadelphia, Pa. June 24–August 2
Public Health Nursing
Social Problems
Nutrition
School Nursing

UNIVERSITY OF ROCHESTER, Rochester, N. Y. June 26–August 2
General Physiology
Methods in Health Education
Methods in Health Activities

RUTGERS UNIVERSITY, New Bruswick, N. J. June 24–August 2
Public Health
Preventive Medicine
First Aid

STANFORD UNIVERSITY, Stanford University, Calif. June 20–August 31
Public Health Nursing
Health Department Administration.
Physical Education and Hygiene

SYRACUSE UNIVERSITY, Syracuse, N. Y. July 2–August 9
Hygiene

UNIVERSITY OF TEXAS, Austin, Tex. June 4–July 15
Child Care and Training
Elementary Health Education

UNIVERSITY OF VIRGINIA, University, Va.
June 17–July 27 (First Term)
July 29–August 30 (Second Term)
Hygiene and Sanitation
Sex Character Education
Biochemistry
Bacteriology
Physical Education

UNIVERSITY OF WASHINGTON, Seattle, Wash.
June 19–July 25 (First Term)
July 26–August 29 (Second Term)
Principles of Physical Education
Physical Education Administration
Nutrition
Bacteriology
Principles of Public Health Nursing and Administration
The Health Education Movement

WESTERN RESERVE UNIVERSITY, Cleveland, O., School of Applied Social Sciences. June 24–August 2
Hygiene and Preventive Medicine
Materials and Methods of Health Education
Graduate Seminar in Supervision
Mental Hygiene
Practical Social Problems of Cities
Social Pathology

UNIVERSITY OF WEST VIRGINIA, Morgantown, W. Va. June 7–July 29
Hygiene and Sanitation

UNIVERSITY OF WISCONSIN, Madison, Wis. July 1–August 9
Junior Red Cross and First Aid to the Injured
Tests and Measurements in Physical Education
Supervision and Organization of Health Education
Bacteriology
Public Health

RADIO PROGRAMS ON UNIVERSAL SAFETY

THE National Broadcasting Company, in coöperation with the National Safety Council, is giving a series of weekly radio addresses by national leaders on "Universal Safety." The purpose of this program is to awaken the American people from an attitude of seeming indifference toward the problem of the national accident fatality toll, numbering nearly 100,000 lives annually. Charles M. Schwab gave the first address, "Safety as a Factor in Industry," on April 20.

NEW ENGLAND HEALTH INSTITUTE

THE seventh annual New England Health Institute, a school of public health open to all public health workers and those interested in public health, was held in Hartford, Conn., the week of April 22–26, 1929. The Institute was sponsored by the U. S. Public Health Service, the Medical Schools of Harvard and Yale Universities, New England colleges, and state departments of health. The program of 84 lectures on the outstanding phases of public health was given by experts in their

respective fields. The fiftieth anniversary of the Connecticut State Department of Health was celebrated by a banquet at which the speakers were: Hon. John H. Trumbull, Governor of Connecticut, Dr. Edward K. Root, Dr. Hugh S. Cumming, Surgeon-General, and Dr. George E. Vincent, President, Rockefeller Foundation.

NEW MIDWESTERN FOOD OFFICIAL

JAMES O. Clarke has been appointed to succeed E. H. Goodnow, resigned, as chief of the Central District of the Food, Drug and Insecticide Administration. Mr. Clarke will direct the work of enforcing the food and drugs act and five other regulatory acts throughout the middle western district from his headquarters at Chicago.

Mr. Clarke has been in the service of the Department of Agriculture since 1917; first in the capacity of a chemist, having previously gained considerable experience in food analysis as assistant to the state chemist of Georgia. For six years he was chief of the station at Savannah, Ga., and in 1926 became chief of the New York station of the Eastern District of the Food, Drug and Insecticide Administration.

THE DIPLOMATE—A NEW PUBLICATION

THE first issue of a new medical periodical, *The Diplomate*, appeared April 3. This magazine is intended primarily for medical students, hospital internes and premedical students, and aims to keep them in touch with medical news and developments, especially in regard to medical colleges, preventive medicine and public health, the state licensing boards and the organized medical profession.

REMINGTON MEDAL AWARD

DR. Wilbur L. Scoville, chief of the analytical department of Parke, Davis & Co., has been awarded the Remington Medal by the American Pharmaceutical Association. The medal was awarded for "distinguished service to pharmacy," as chairman of the National Formulary Committee.

SPECIAL CHILD HEALTH TOUR

IN connection with the meeting of the Health Section of the World Federation of Education Associations in Geneva, Switzerland, next summer, a special tour for the study of child health activities in Europe is being arranged. This tour is for people professionally interested in child health, particularly school health. The dates of the tour are June 29 to September 1. Persons interested in joining this group should write to Professor C. E. Turner, Massachusetts Institute of Technology, Cambridge, Mass., who is chairman of the Health Section of the W. F. E. A.

EAR, NOSE AND THROAT STUDY

THERE will be an Ear, Nose and Throat Course, for American physicians only, at the University of Bordeaux, France, commencing July 22, 1929.

Dr. Leon Felderman, Philadelphia, Pa., is in charge of registering the American physicians.

HEALTH SCOUTS IN PALESTINE SCHOOLS

SCHOOL children in Palestine have been organized as sanitary inspectors to help raise the country's standard of public health. Their tasks are to safeguard the hygienic and sanitary conditions in the schools; help the school nurse in her teaching of hygiene; and to influence the homes in accordance with modern scientific regulations taught them by the department of hygiene. The health scouts visit dairies and food shops, submitting reports to the department.

PERSONALS

JESSE L. MEGARGEL, of the Hammonton, N. J., Board of Health, has been awarded the Anderson Memorial Gold Medal for distinguished services to the community along the lines of diphtheria prevention.

DR. JOHN J. SIPPY was elected president of the Northern California Public Health Association, succeeding Dr. William C. Hassler.

DR. B. S. STEPHENSON, Health Commissioner of Shelby County and Sidney, O., will attend the International Health Conference at Zurich in May.

DR. OLIVER KAMM, chief of the Chemical Research Division of Parke, Davis & Co., was elected president of the Michigan Academy of Science, Arts and Letters at its annual meeting held at the University of Michigan, Ann Arbor, during the third week in March.

DR. HUGH CARTER, of the Department of Sociology, University of Pennsylvania, has joined the staff of the Committee on the Cost of Medical Care, Washington, D. C. Dr. Carter has just completed a statistical study of Public Poor Relief in Pennsylvania since 1875 for the Commonwealth Fund and the Public Charities Association of Pennsylvania.

DR. DAVID KELLOCK, Health Officer of Harrisville, N. Y., died March 9 after a brief illness.

DR. AUGUSTUS MAYER, health officer of the town of Delaware, Sullivan Co., N. Y., died March 4.

DR. CALVIN L. COOPER has been appointed Health Officer of Kansas City, Mo., to succeed Dr. Porter E. Williams. His appointment will go into effect May 1.

DR. GEORGE F. REDDISH (Referee on Disinfectants of the Committee on Standard Methods of the A. P. H. A.), formerly Senior Bacteriologist in the Food, Drug and Insecticide Administration, Department of Agriculture, Washington, D. C., is now with the Lambert Pharmacal Co., St. Louis, Mo., as their chief bacteriologist.

DR. REGINALD J. H. STROUD was appointed State Superintendent of Public Health of Arizona by Governor Phillips.

ETHEL GROSSCUP is secretary of health instruction, Committee on Tuberculosis and Public Health, S. C. A. A., New York, N. Y.

CONFERENCES

May 7–8, Association of American Physicians, Atlantic City, N. J.

May 5–10, First International Congress of Mental Hygiene, Washington, D. C.

May 13–15, American Proctologic Society, Detroit, Mich.

May 14–17, American Psychiatric Association, Atlanta, Ga.

May 27–31, National Tuberculosis Association, Atlantic City, N. J.

June 13, International Hospital Congress, Atlantic City, N. J.

June 17–21, Annual Convention, American Hospital Association, Atlantic City, N. J.

June 24–28, American Water Works Association, Toronto, Can.

June 26–July 3, National Conference of Social Work, San Francisco, Calif.

July 8–13, International Council of Nurses, Montreal, Can.

July 9, American Heart Association, Scientific Session, Portland, Ore.

FOREIGN

May 15–20, International Congress of Public Health, Zurich, Switzerland.

July 13–20, Fortieth Congress and Exhibition of the Royal Sanitary Institute, Sheffield, England.

July 17–August 13, Third Vienna Summer School, University of Vienna, Austria.

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Training in Military Preventive Medicine*

GEORGE C. DUNHAM, M. C., U. S. A., M. D., DR. P. H.,
FELLOW A. P. H. A.
Director, Department of Sanitation, Medical Field Service School, U. S. Army, Carlisle, Pa.

THE prevention of disease and the promotion of health among its personnel is one of the most important activities of a war-time army. The day is past when an army can be mobilized, trained and successfully employed in combat unless every possible measure is taken to protect the health of the troops. The army consists of men drawn from all walks of life and from all types of environment. During and after mobilization, each individual is subjected to environmental conditions which, unless controlled, will entail a high degree of exposure to infectious disease.

The prevention of disease and the promotion of health in a military force are no longer considered on humanitarian grounds only, nor ignored when rendered inconvenient by purely military activities. Preventive medicine enters so intimately into all training and operation that it has become an essential military factor which must be provided for in all plans. No American army in the future can reasonably hope to defeat the forces of a first class enemy power if the troops are not given adequate protection against disease.

The health of a force can be protected and maintained only when the plans are formulated and carried out by officers trained in health work. It follows that in the event of an emergency which would compel the United States to engage in a major war, the control of disease among the troops must be accomplished mainly by men who are now working in the field of preventive medicine in civil life as physicians, engineers, technicians, research workers, and such. The

sanitarians of the Regular Army are few and could not possibly cope with the work that would be made necessary by mobilization. The National Defense Act provides for this contingency by authorizing during peace the organization and training of an Officers Reserve Corps.

The Medical Department Reserve has approximately 20,000 officers, organized into 5 sections: Medical, Dental, Veterinary, Sanitary and Administrative. The Medical, Dental and Veterinary Sections are composed of doctors of medicine, dentistry and veterinary medicine, respectively. The Sanitary Section consists largely of sanitary engineers, and experts in bacteriology, nutrition and metabolism, chemistry, and so on, with specialists in certain other lines not concerned with health.

The Medical Department is responsible to higher military authority for the initiation and supervision of all disease control and health promoting measures. Early in the World War it became apparent that officers trained in medicine alone were not equipped to solve many of the health problems requiring an expert knowledge of one of the allied sciences; consequently, steps were taken to commission in the Medical Department those having the required training. This group, with those commissioned since the World War, now constitutes the Sanitary Section of the Officers Reserve Corps.

The Medical Department officers who will supervise the health work and train others during any future war will be drawn largely from those in the Medical and Sanitary Sections of the Reserve who have had experience in preventive medicine. These officers will have received their basic training in medicine in the performance of their professional work in civil life. They must, however, receive a certain amount of training in military preventive medicine before they can function efficiently with a military force. This can be obtained either by organized training during peace or by the trial and error method after war is declared.

Military preventive medicine differs from that in civil communities in its administrative features, and to some extent in the means employed in the application of accepted procedures. It must be remembered that the primary mission of the army is to defeat the enemy and that all other functions and activities are subordinated to the accomplishment of that mission. A military force is a *machine*, each part of which must operate in coördination with all other parts. This does not mean that disease control measures can be neglected or ignored, as they are of vital importance to the success of training and combat operations. They must however be so adapted to existing

conditions as to afford the required protection with the least practicable interference with other activities. Military preventive medicine differs from that practiced in civil communities to an extent which renders it necessary for reserve officers, who are experts in their fields in civil life, to acquire additional training in order to apply successfully their knowledge to military conditions.

In the practice of military preventive medicine, measures must be adapted to, or modified to conform with, the restrictions and limitations imposed by a constantly changing situation. While military factors may at times prevent the adoption of a more desirable though more elaborate procedure, the administrative control of health is far more complete in a military, than in the average civilian, community. The extent of this control is such that the resulting protection in an army is, in general, much more effective than that in a civilian community, provided the officers in charge are conversant with the military phases of preventive medicine.

It is obvious that all reserve officers should receive basic military training in time of peace in order that they may be prepared to train other officers and enlisted men in the event of war. Under the provisions of the National Defense Act, such training is provided, including the organization and functions of military units and the strictly military features of the various services. While this is basically essential for those officers who are to be assigned to health work in the army, it does not prepare them for their special duties since it does not show them how their knowledge can be applied under military conditions.

Reserve officers, who are specialists in preventive medicine, will in most instances be assigned in war to duties connected with disease control and health promotion in the army. They should therefore receive training during peace-time in the military phases of their wartime duties. Basic military training, as described above, does not meet this need, and so special courses of instruction must be given.

Instruction of this character can be given in two ways under the schemes now authorized by the federal government. Selected reserve officers may be detailed to attend a summer training camp or they may be given correspondence courses. The summer training camp has the disadvantage of short duration—usually 2 weeks—and of occurring at a time when not all reserve officers can leave their normal vocations. It has the great advantage of bringing officers into personal contact with one another and with their instructors, and of making the training much more practical. Correspondence courses may be made quite extensive and inclusive in subjects which can be

taught by correspondence. They may also be undertaken when, and as rapidly as, the student has the available time. A disadvantage is the difficulty of imparting adequate instruction in certain subjects of a more practical nature.

Prior to 1928, no definite instruction in military preventive medicine had been offered to reserve officers, but for several years there had been an increasing demand for such a course. This was due partly to the progress in disease prevention, and partly to the growing realization of the important rôle which disease control will play in the next war. To provide a means for giving this instruction, an annual 2 weeks' summer camp course was established at the Medical Field Service School, Carlisle Barracks, Pa., from July 8 to July 21, 1928. This is known as the "Special Course—Military Sanitation," the term "Military Sanitation" being used to denote all phases of military preventive medicine.

Attendance is voluntary, selected officers who indicate the desire being ordered to active duty for training purposes. The 1928 class consisted of 46 reserve officers, members of the Sanitary and Medical Sections of the Medical Department Reserve. These officers, with a few exceptions, are in civil life engaged in work concerned, directly or indirectly, with the prevention of disease, and all would be assigned to disease control work if called to active duty. Some are sanitary engineers, others health officers of civil communities, specialists, research workers or teachers in such sciences as bacteriology, nutrition and chemistry. A number of them are widely known authorities in their particular fields.

The instruction given during the course is intensive and designed to emphasize the military aspects of preventive medicine. It consists mostly of practical demonstrations showing how the usual disease control procedures would be executed in given military situations. Didactic instruction is reduced to a minimum and discussions of technical procedures are limited to orientation and preparation for practical demonstrations. Methods of conducting sanitary surveys are demonstrated and instruction is given in the preparation and enforcement of the sanitary order (the sanitary code of a military community). Throughout, stress is placed on the administrative features of disease control and the practical methods of coördinating this work with other military activities. Much attention is devoted to the means by which coöperation between the Medical Department and other branches, both staff and line, is maintained for the purpose of protecting and promoting the health of the troops.

The application of disease control procedures in selected military

situations is considered for mobilization and training camps, concentration areas and camps, and the combat zone. Terrain exercises, in which the situation being depicted is simulated in the field, are utilized.

As the 1928 camp course was the first organized course of instruction in military preventive medicine given to reserve officers since the World War, it was in a way an experiment conducted to determine two important factors: (1) whether the reserve officers concerned desired this kind of training; and (2) if teaching the military phases of preventive medicine by a 2 weeks' summer training camp course is a practical procedure.

The type and number of reserve officers who took the course justifies the conclusion that training of this nature is desired by those interested in preventive medicine. This is an important factor as no scheme for the military training of the Reserve components of an army can be successful in peace if it is not supported by public opinion as expressed by the members of the group who are to be trained.

The experience gained definitely indicates that it is a practical method of teaching the military features of military preventive medicine, and that it will give results which are of great value to those taking the course. It offers what is apparently the best method at present of instructing reserve officers, and should prove a valuable contribution to military preparedness.

Juvenile Court Statistics in Belgium

THE number of cases handled by the juvenile courts of Belgium decreased from nearly 17,000 in 1913 to 11,000 in 1927, according to statistics published by Dr. Isidore Maus, Director General of the Belgian Child Welfare Office. This decrease has been particularly great and constant since 1920, and is attributed by Dr. Maus partly to the improvement of the economic situation of the working classes and the decrease in the birth rate during the war, and partly to the effect of the child welfare law of 1912, which provides for probation and other preventive and corrective measures.

The number of cases put on probation has shown a tendency to increase in the last few years. There has also been a considerable increase in the number of cases committed to specialized institutions. The number of cases referred to societies or institutions interested in general care of children has continued to decrease greatly.

The jurisdiction of the juvenile court ends at the age of 21. A follow-up study of nearly 10,000 former juvenile delinquents showed that between the ages of 21 and 26, 82 per cent had no conflict with the law.—*L'Application de la loi du 15 Mai 1912 sur la Protection de l'Enfance de 1913 à 1927*, Brussels, 1928, 27 pp.

The Sanitary Control of Ice Cream*

F. W. FABIAN

Department of Bacteriology, Michigan State College, East Lansing, Mich.

ICE CREAM is no longer considered a confection or luxury, but a food. Since it contains on the average approximately 22 per cent milk solids, it is a dairy product. It has won a high place in the American diet and is recommended by leading dietary authorities as an attractive way of serving milk to the family.

There is reason to believe that it was known in Europe as early as the 13th century and certainly in the 16th, though it did not assume the position it rightfully merits until recently. The ice cream industry as we know it today is a development of the last 25 years, during which time it has reached tremendous proportions, especially in the United States. This is due to several factors, the most important of which are its food value, modern machinery, and modern methods of merchandising.

It was estimated that the production of ice cream in 1927 in the United States was 335,703,610 gallons, a per capita consumption of 2.85 gallons. In 1910 the estimated production was 95,450,000 gallons. The capital invested in 1926 was estimated to be over $450,000,000.

METHODS OF SANITARY CONTROL

Milk, cream, condensed and evaporated milk, milk powder and butter are used in the manufacture of ice cream, and contribute by far the greater number of bacteria to it. Other constituents, such as gelatin, sugar and flavoring extracts, are used in such small quantities, or contain so few bacteria, that they may be left out of consideration. The fundamental problems of ice cream and milk control are the same.

To produce wholesome ice cream we must start with clean, raw products properly pasteurized and processed in clean machinery operated by sanitary workers. The requirements for milk for ice cream should be the same as those for market milk. The same sanitary safeguards should surround all dairy products whether they enter the ice cream mix or are used in some other way.

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* Read before the Food, Drugs, and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

PASTEURIZATION

More interest is being shown in this phase of ice cream control than in the past. In 1926 a committee of this Association recommended legislation requiring nation-wide pasteurization of the ice cream mix. The manufacturers themselves are in favor of such action, as expressed by the Secretary of their association:

> Pasteurization of ice cream mixes should be made universally compulsive and it is interesting to see that so many states this year took action on this subject. The National Association is on record favoring pasteurization of the ice cream mix. It would seem desirable for state associations to encourage the passage of pasteurization laws in their respective states.

Activity has been manifested during the past three years in this direction. According to the latest information available 2 states and 1 province require the ice cream mix to be pasteurized; 11 states and the District of Columbia require the milk and cream used in the mix to be pasteurized. Some of the states require that all milk be obtained from tuberculin tested cows; prohibit the handling of ice cream by those having an infectious disease; and require a health certificate for those employed in making ice cream. These are necessary safeguards and should be included in any law governing the manufacture of ice cream.

As in the case of milk, the time and temperature requirements for pasteurizing the mix for the different states are variable, ranging from 140° F. for 25 minutes to 185° F. flash. This is unfortunate. After studying the results secured by one commercial plant over a period of years Fabian recommended a temperature of 150° F. for 30 minutes. Due to the nature of the product this higher temperature is necessary to insure proper results. The product is injured in no way physically.

Some laws require that only the milk and cream used in the manufacture of ice cream be pasteurized. It is much more satisfactory to require pasteurization of the whole mix, since it gives more uniform results and is in accord with the best practice of the industry.

TOOLS OF THE HEALTH OFFICER

In controlling the sanitary quality of ice cream the health officer has two effective tools—bacteriological analysis of the finished product, and sanitary inspection of the plants. It is recognized that while mere numbers of bacteria may not be significant from a sanitary standpoint, in the case of dairy products an excessive number is generally associated with carelessness. With proper care it is possible to produce ice cream with a bacterial count of around 100,000 per gram. A count greatly in excess of this may be due to any one or all of the

following: poor quality of ingredients, inefficient pasteurization, improper ageing, deficient cleansing of equipment, and carelessness of the employees.

Data have been assembled showing that it is possible and desirable to produce ice cream having a bacterial count of 100,000 or less per gram. Fabian has suggested a bacteriological standard of 100,000, based on 1,110 samples from 36 plants in 5 cities in Michigan.

Only one state has a bacteriological standard for ice cream. In 1927, California passed a law which states, "Ice cream, when sold by the manufacturer, shall not contain in excess of 150,000 bacteria per gram." Several cities have adopted bacteriological standards. Louisville, Ky., has a standard of 800,000 bacteria per c.c.; Harrisburg, Pa., 200,000 bacteria per c.c.; Concord, N. H., has a standard designating grade A ice cream, containing not more that 100,000, and grade B, containing not more than 1,000,000. Boston, Mass., limits the number of bacteria to 500,000 per c.c. Baltimore, Md., allows 200,000 at present, but its ultimate goal is 100,000. While Detroit, Mich., has no legal standard, its aim is to keep the bacteria below 100,000. Chicago, Ill., has a maximum of 500,000 bacteria per c.c. for pasteurized mixes, and no definite standard for the finished product, but requires that it shall not contain an excessive number.

I would suggest to those enacting laws or ordinances that "bacteria per gram" be used instead of "bacteria per cubic centimeter," since I believe that bacteriological determinations of ice cream made on the gravimetric instead of the volumetric basis will be more uniformly satisfactory. The gravimetric basis is used entirely for chemical determinations in ice cream and should be for bacteriological determinations. The volumetric method was inherited from milk analysis and is hard to get rid of.

Some progress has been made in standardizing the methods for analyzing ice cream. The committee appointed by the American Dairy Science Association has published a preliminary report,* and in 1927 the committee appointed by The National Association of Ice Cream Manufacturers made its first report, the two being in essential agreement. We now have outlined definite methods of procedure, among which are: the plate, direct microscopic, the methylen-blue test, and the anerobic spore test, recently proposed by Weinzirl and Harris. There has been some work on the colon group test. However, I do not believe that it has been sufficient to warrant any definite conclusions at this time.

* Copies of this report may be obtained from R. S. Breed, Ph.D., Geneva Experiment Station, Geneva, N. Y. Price, 25 cents.

A potent agency in the sanitary control of ice cream is periodic inspection. This has been found of benefit in other industries and has produced good results in the ice cream industry when consistently practiced. A great aid in the inspection of ice cream plants is the score card. The one with which I am more familiar is being used with success in several large cities. Periodic inspection plus regular bacteriological analyses will do much to keep a close check on the sanitary quality of the product.

WHY ARE SANITARY REGULATIONS NECESSARY?

Owing to a mistaken belief in the germicidal effect of cold, it was thought for a long time that bacteria present in ice cream would be killed by freezing and the subsequent process of hardening in which a temperature as low as — 21° C. was reached. Experiments have demonstrated that many of the pathogens are viable after being exposed to liquid air (— 182° to — 190° C.) for 7 days, and liquid hydrogen (— 252° C.) for 10 hours. It is well known that typhoid bacilli may remain alive in ice for a considerable time. Experiments have shown that they may remain alive in ice cream for 2 years and 4 months, when kept at an average temperature of — 4° F. Other work has demonstrated that hemolytic streptococci and the diphtheria bacillus may remain viable for considerable periods of time in ice cream.

Another line of evidence even more convincing is the numerous epidemics that have been definitely traced to ice cream. Fabian compiled a list of outbreaks attributed to ice cream, and since then reports of many more have been found, which will be published later. Epidemics of typhoid fever, septic sore throat, diphtheria, scarlet fever, dysentery and intestinal disturbances have been reported.

It is interesting to trace the history of ice cream epidemics. They can be grouped roughly according to the period in which they occurred. The first, extending from about 1848 to 1886, may be called the metallic poisoning period, since at this time they were attributed by most workers to poisoning from metals as tin, arsenic and zinc, while others were inclined to lay the blame on the vanilla extract used. The second may be desgnated the ptomaine poisoning era. In 1886 Vaughan discovered and isolated tyrotoxicon. Thereafter, for about 10 years, unless otherwise demonstrated, all ice cream poisoning was attributed to ptomaines. In the third period bacteria came into their own, and most of the epidemics have been definitely traced to a specific organism.

Today with the greatly improved machinery, and with our present

knowledge of sanitation and the application of science to these problems, there seems little excuse for an insanitary or unwholesome product. The ice cream manufacturers as a whole are far more alive to the best interests of their industry than any other group with which I am familiar. They kept abreast of the times and installed expensive pasteurizing and refrigerating equipment in their plants while many health officers were still slumbering. They did not wait for laws or ordinances requiring such action, but while the health officer was fearful about recommending such measures, they were obeying a more urgent law—the economic law. Experience had taught them that a sanitary product was their best business asset. One epidemic directly traced to a plant would tear down more than years of advertising could build up.

One of the finest tributes that can be paid to their good judgment is that, although more ice cream was manufactured in 1927 than ever before in the history of the industry, not one single epidemic was traced to it.

Italian Traveling Tuberculosis Dispensaries

TRAVELING tuberculosis clinics have been recently established in some provinces of Italy for the purpose of carrying medical aid to outlying districts.

Each traveling clinic consists of a large automobile containing equipment to aid in diagnosis of cases of tuberculosis, including a microscope and X-ray apparatus. A physician with two or more assistants is in charge of each.

Upon arrival in a district, the staff of the clinic examines the school children and advises the local authorities with regard to methods of dealing with those who have tuberculosis, such as providing financial aid and hospital and sanatorium treatment. Detailed records are made of each case.

Adults who are known to have tuberculosis, but who are not under medical care, are also examined at the traveling clinic, and provision for their treatment is made. The work of the traveling clinic in each district is concluded with a public lecture on tuberculosis given by its staff.

Recently the National Bureau of Public Health, in a circular addressed to local authorities, has recommended the introduction of such traveling clinics in the small towns and rural localities throughout the country.—*Difesa Sociale,* Rome, Sept., 1928, p. 11.

Nutritive Value of Ice Cream

L. S. PALMER, PH. D.

Professor of Agricultural Biochemistry, University of Minnesota, St. Paul, Minn.

ON theoretical grounds there is abundant evidence to support the belief that ice cream has a high food value. Food authorities and public health officials everywhere have recognized the importance of ice cream as a food, and there have been several more or less practical demonstrations of this fact with public school children. From a more strictly scientific standpoint Smith [1] has shown that ice cream contains the fat soluble A and water soluble B vitamins. However, no one has published data demonstrating under experimental conditions in what manner ice cream supplements a more or less natural diet of the bread, meat, potato and cereal type, during growth. Likewise, it is not known what kind of growth would result if the diet were limited exclusively to ice cream.

The experiment described in this report was for the purpose of answering these questions. It was conducted in the animal nutrition laboratory of the National Dairy Council, at Forest Lake, Minn. The animals used were albino and piebald rats bred in the laboratory. The ice cream used was standard commercial vanilla ice cream purchased in the local market, and was *not* manufactured especially for the experiment. The product used had a standard composition of 38 per cent total solids and 12 per cent fat.

Three types of diets were employed: (1) a basal diet containing no ice cream, (2) the same diet mixed daily with 33⅓ per cent by weight of fresh ice cream, (3) fresh ice cream alone without any other food. Fresh tap water was supplied daily, *ad libitum,* in syphon fountains attached to the outside of the cages. The all ice cream and the one-third ice cream diets were allowed *ad libitum.* The no ice cream basal diet was moistened with water to the moisture content of the one-third ice cream diet. The amount allowed was limited to that consumed by the group receiving one-third ice cream, this being determined each day. The ingredients of these diets are shown in Table I, and the approximate analyses in Table II. The basal diet was designed so that the supplementary effect of the vitamins in the ice cream would particularly be manifested.

The animals were housed in groups in suitable cages having metal

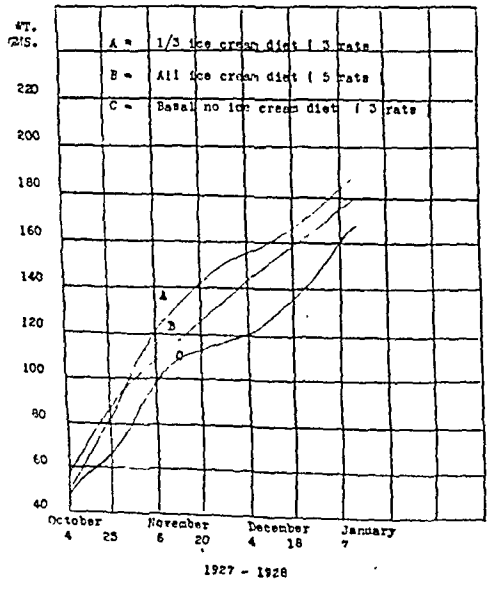
TABLE I

INGREDIENTS OF BASAL AND ONE-THIRD ICE CREAM DIETS AS FED

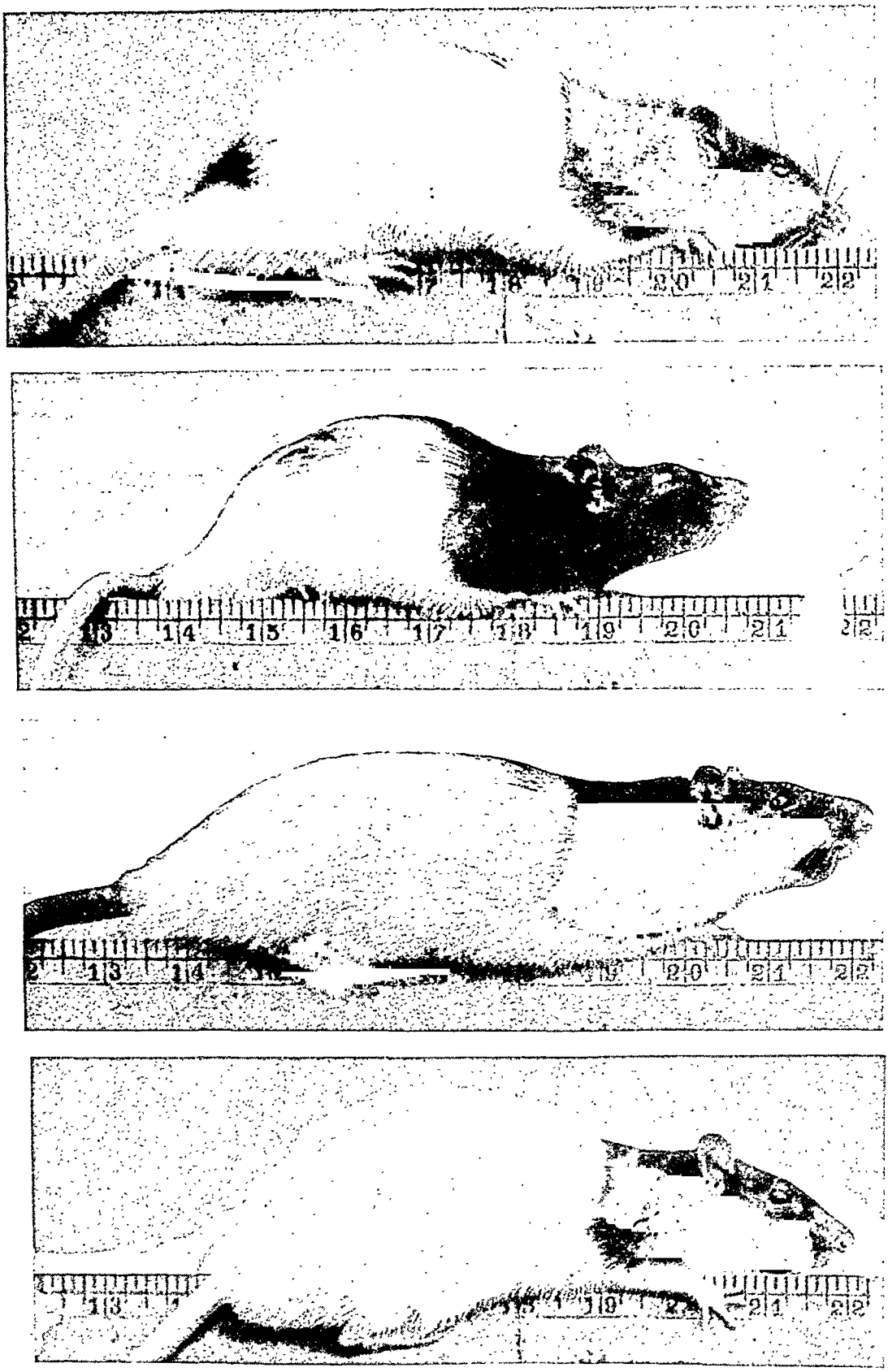
Ingredient	Basal Diet Per Cent	One-third Ice Cream Diet Per Cent
Ice cream	0	33.33
Added water	12.50	0
Dry bread	26.25	20.0
Potato flour	17.50	13.33
White corn	13.13	10.00
Extracted casein	7.87	6.00
Lard	7.00	5.33
Dry cooked beef	4.37	3.35
Oatmeal	4.38	3.35
Sugar	3.50	2.65
Bone meal	2.63	2.00
Salt	0.87	0.66
Total	100.00	100.00

floors covered with shavings. These were cleaned once each week and fresh bedding provided. Food consumption was recorded. The basal and one-third ice cream groups consisted of 3 rats each, and the all ice cream group of 5 rats. Bi-weekly weights of all animals were recorded for the first 90 days, the animals being placed on the diets at weaning, when they were 3 to 4 weeks of age. Males only were used. One group of litter mates distributed among the three experimental groups, and one other of the same litter on the breeding diet, on which similar records were kept, were continued on the diets until 44 weeks of age. These animals are shown in the accompanying photographs.

FIGURE I



The average growth curves of the animals in the several groups for the first 90 days of the experiment are shown in Figure I. The rate of growth of all these animals was considerably slower than that of animals fed the breeding diet; but by the end of 10 months the one-third ice cream group had reached the same weight as the breeding animals, namely, 375 to 400 gm. The animals fed ice cream alone were still gaining at that time and eventually attained the full mature weight for this strain of rats. The animals fed the basal diet



This shows four male rats, litter mates, each at 44 weeks of age, which had been fed respectively, from the time of weaning, on (a) the breeding diet, (b) the basal no ice cream diet described in Table I, (c) the one-third ice cream diet described in Table I, (d) standard commercial vanilla ice cream as the sole diet. The method of feeding diets (b) and (c) is stated in the accompanying article. Rat (a) weighed 375 gm., Rat (b) 205 gm., Rat (c) 400 gm., Rat (d) 300 gm., at the time the photographs were taken.

TABLE II

APPROXIMATE COMPOSITION OF BASAL AND ICE CREAM DIETS
(DRY MATTER BASIS)

	Protein Per Cent	Carbohydrate Per Cent	Fat Per Cent	Nutritive Ratio*
Basal	21.25	59.3	14.2	1 : 4.29
One-third ice cream	19.94	59.8	16.4	1 : 4.82
All ice cream	10.25	58.2	31.6	1 : 12.60

* Ratio between the energy supplied as protein and the total energy of the diet.

without ice cream ceased gaining when they attained one-half this weight, namely, about 200 gm.

Study of the individual growth records of the animals, which are omitted to save space, shows that at the end of the 90-day period none of the animals fed the basal, no ice cream diet, attained the weight of the poorest animal fed this diet mixed with one-third by weight of ice cream, although the mean consumption of total nutrients was the same. Likewise, only 1 animal in the basal group attained the weight of the poorest animal fed ice cream alone, each of the other 4 animals fed ice cream as the sole diet exceeding it by 15 to 30 gm.

A study has also been made of the efficiency with which the groups utilized their food for growth in terms of dry matter consumed for each gm. gained per 100 gm. body weight. The details are omitted for the sake of condensing this report. The mean values for the 90-day period were as follows: for the basal group, 8.74 gm.; for the one-third ice cream group, 6.04 gm.; for the all ice cream group, 5.44 gm.

The results of the experiment are believed to offer important evidence regarding the nutritive value of ice cream. The standard vanilla ice cream used was a valuable supplement to certain types of diet for growth. In addition, the same ice cream alone was capable of promoting growth at a moderate rate to produce mature animals of normal or nearly normal size and weight.

REFERENCE

1. Smith, A. H. *J. A. M. A.*, 79: 2221, 1922.

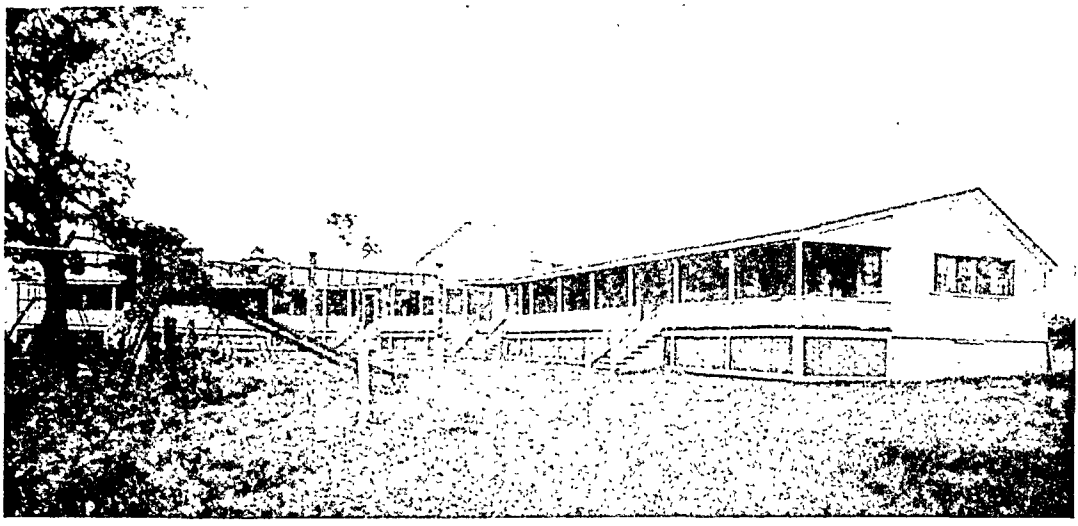


FIGURE I—Main Building, Lowell Summer Camp

Lowell Fights Undernourishment Among Its School Children*

JOHN J. McNAMARA, M. D.

Director of School Hygiene, Lowell, Mass.

LOWELL, Mass., with a school population of approximately 23,000, found itself compelled in the summer of 1928 to enter the good health market on a large scale. Its immediate purpose was the upbuilding of malnourished and underweight school children; its objective was the purchase of good health insurance for its future citizens.

An outdoor camp for 140 boys and girls and a health center with daily accommodation for 125 children were established. The money and effort expended were justified by the results.

For the last 4 years the annual examinations of the Massachusetts Ten Year Survey, conducted by the State Department of Public Health in conjunction with the Lowell Division of School Hygiene, have brought to light the fact that the number of Lowell children listed as the hilum tuberculous, the latent tuberculous, the suspects, and the contacts, formed surprisingly large groups. This hurt civic pride. A more startling fact, however, was revealed—that these groups, all of which came under the broad classification of the pretuberculous and underweight, made each year no worthwhile progress.

It was found that, while the examination of the children and the work of the teacher and school nurse, including advice to parents, were effective during the school year, during the summer months the results were largely lost. Though vacation should have been the pe-

* A resumé of an intensive summer campaign in health camp and health center.

riod of greatest gain, it was worse than wasted time. Knowing what these conditions meant for the future of the children and the community, and that there was no hope of passive acquisition of good health by these groups, the health department realized that if any material progress was to be made, the city must put forth its maximum of effort through the entire year, and that the break in the campaign for child health, from June until September, must be closed.

PLAN OF CAMPAIGN

In 1927 the city had established a municipal summer camp, and a health center had been sponsored by the Tuberculosis Council. They were valuable as a beginning, but left much to be desired. The obvious duty of the health authorities was to improve them, and make them coöperative and effective. The 1927 camp was for the day only. Transportation was furnished to and from a central meeting place in the city, but much of the good accomplished during the day was neutralized by the fatigue of the journey between home and camp. Moreover, there could be no supervision of hours of sleep, food, or hygienic habits, and there was an ever-present fear that some children might be exposed to contagion and on their return infect the camp.

In 1928, the ideal type of summer health camp was established. The so-called " Day and Night Camp," in which the children spend the entire 24 hours, was put into operation. It is, in several respects, ideally situated.

While the site is within the city limits, it has all the advantages of a country location. Although adequately isolated from dwellings and from contact with the more thickly populated city districts, it is easily accessible to parents, both by automobile and electric railway. Regulations, not too stringent, and easily enforced, prevent too many visitors at hours that might disrupt camp discipline and routine.

The grounds, some 10 acres, well grassed and drained, are on a fair elevation above the surrounding country. Northward is the valley of the Merrimac, and a clear, unobstructed view of the White Mountains in the distance. A grassy slope gives space for play, and a large oak makes a natural playground center with ample shade.

A wealth of recreational apparatus, practically all donated by the Lowell Gas Light Company, includes fifty swings, chutes, teeters, sand boxes for the very young, and athletic paraphernalia, basket balls, footballs, push-balls, volley-balls, a basket ball course, quoits and rainy-day and piazza games. A row of outside showers, with platform, made up for the lack of a wading pool, and were of practical use in the bathing of the children at the opening of the camp.

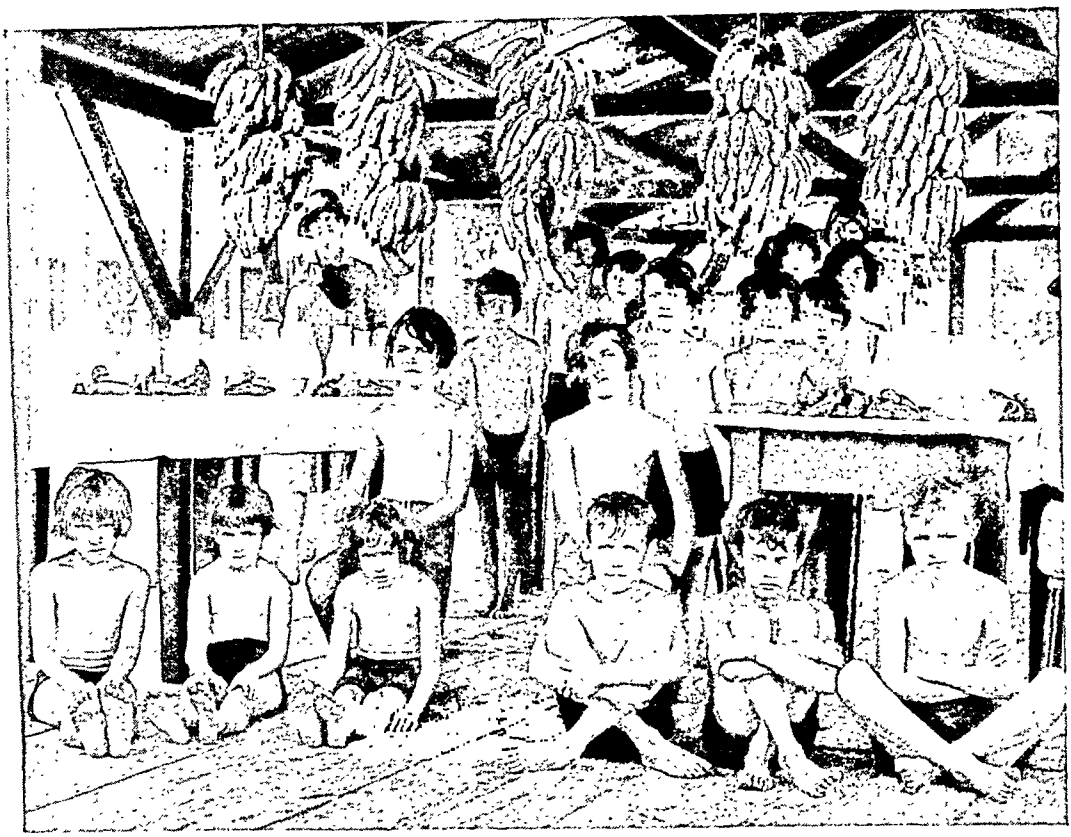


FIGURE II—Dining Pavilion, ready for milk and banana morning lunch

Permanent buildings capable of housing 125 to 140 children constitute the camp quarters. The main building has two wings, one used as sleeping quarters for the girls, and the other for the boys. Regulation iron hospital beds with mattresses, bed covering and linen, without pillows, are provided. A central administration building contains the director's office, nurses' quarters, and platform for scale and weight charts. There are two smaller buildings, one containing the kitchen and commissariat, with attached out-door, roofed dining pavilion, which accommodated the entire camp at meal time (Figure II), and the other a duplex toilet.

Sanitation of summer camps presents an important problem. The majority, because of their location, have no sewer connection, so that septic tanks and wells must be installed for disposal of excreta and waste. This was the method employed at the Lowell camp. Garbage and other waste were removed by health department employees every second day. An uncontaminated and plentiful water supply was available through connection with the city mains.

The personnel of the camp consisted of a director, 8 graduate nurses, 5 of whom had more than one year's experience in this type of work. Of the other 3, 1 was a school nurse who had had previous

contact with many of the children, and the other 2 were surgical nurses who spoke more than one language, mainly French. This was quite important in advising the parents of some of these children on their visits to camp. The value of a thoroughly trained and capable personnel cannot be emphasized too strongly.

The day shift comprised 3 nurses, a dietitian and her assistant, who were also nurses, and a physical instructor who acted as day custodian. The night shift was made up of 2, and for a time, 3 nurses, and a night custodian.

The camp was open practically 8 weeks, during July and August. Both boys and girls were cared for without any difficulty or undesirable incidents.

The selection of the children is of paramount importance and must be carefully made if the maximum value of such work is to be realized. Those selected should comprise the groups most in need of attention, either because of physical defects or a lack of health knowledge in their homes; they should be free from infectious diseases, and not recent contact with contagion.

The plan followed, recruited from the schools those listed in the Ten Year State Survey and by the school physicians and nurses as being among the hilum tuberculous, either active or latent, suspected or contacts with open cases, or those showing malnutrition as evi-

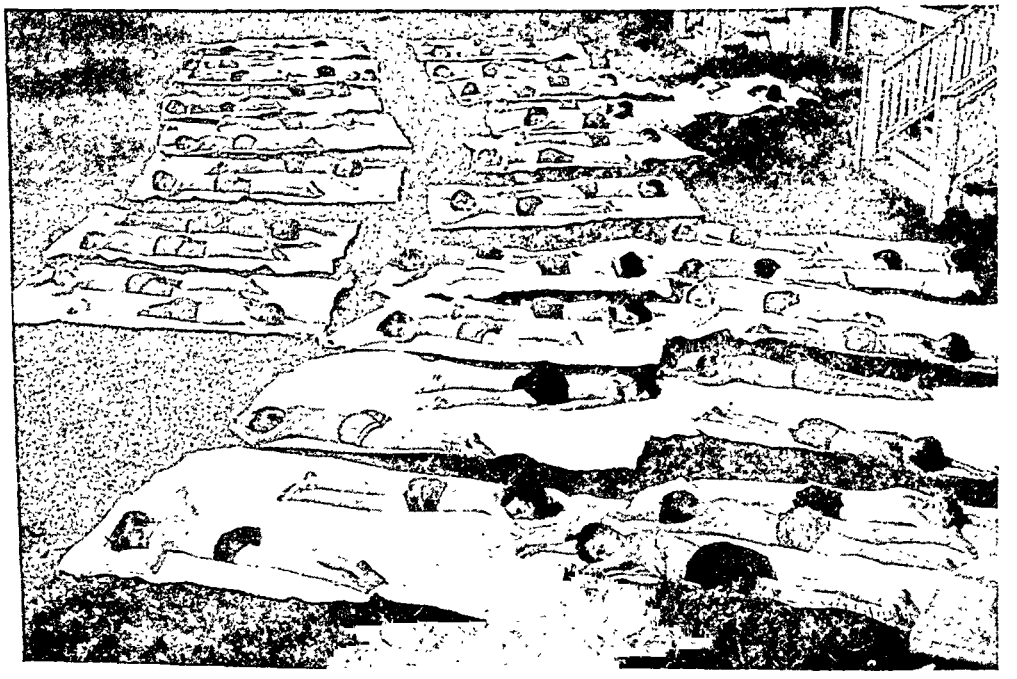
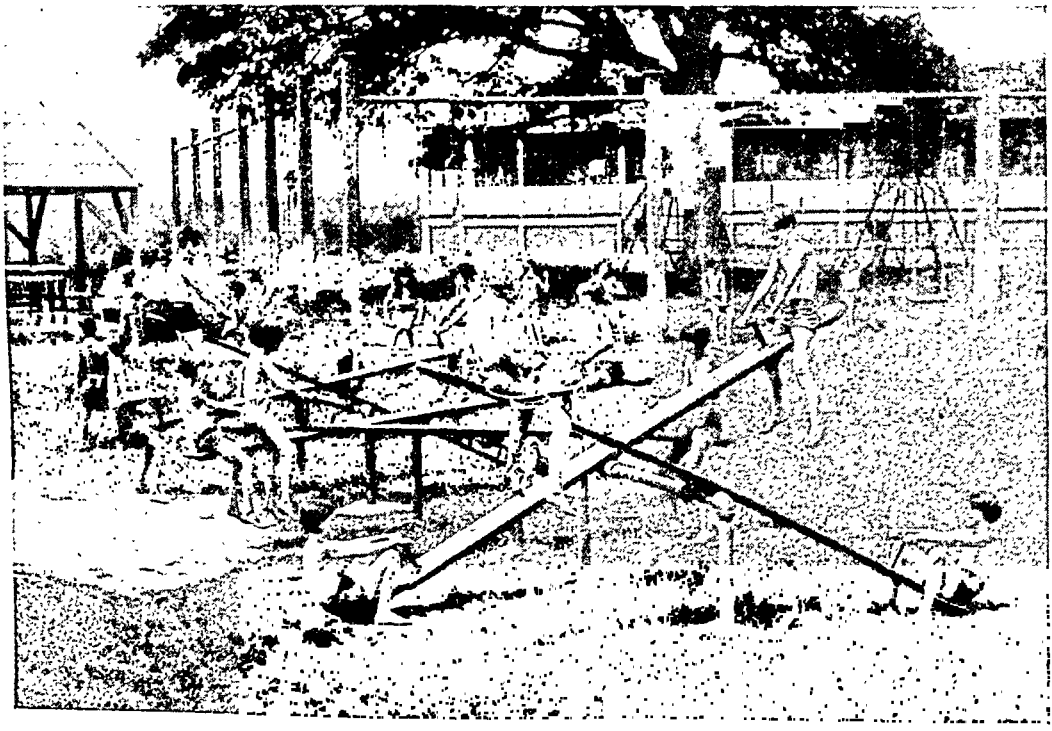


FIGURE III—The Sun Bath



FIGURE IV—Morning Lunch Hour at Edson School Health Center





FIGURES V and VI—The Playground showing sand pile for younger children and vigorous activity which the children acquired as summer advanced

denced by being at least 10 per cent underweight. In addition some children recommended by private physicians and outside agencies were accepted. Before the opening of camp the candidates were given an examination to discover carriers of disease, or detect those from homes harboring contagious diseases. All suspicious throats were cultured. This also gave an opportunity to have carious teeth remedied before the opening of camp. During the school year a large percentage of the children recommended for the summer health camp were encouraged by the school nurses to have such foci as infected tonsils or teeth attended to in order that they might be eligible.

The average daily attendance at camp was 93—58 girls and 35 boys—augmented by 50 children during the last 2 weeks. These 50 had already received considerable preliminary training by continuous attendance for 6 weeks at the Edson School Summer Health Center, and were cases which, it was believed, would benefit to some extent even from the short time at the health camp.

DAILY SCHEDULE

7:00 A.M.	Out of bed. Roll call. Attention to personal hygiene, hands, face, teeth, under supervision.
7:20	Assembly for breakfast. Washing of personal dishes.
7:45	Arrangement of personal quarters, which included the making of beds by the older children. (Policing of the buildings, sleeping quarters and grounds performed by adult custodian.)
8:00	Recreation. Supervised play.
9:30	Heliotherapy. One-half hour maximum, lying prone on sheets in grassy play field in front of main building.
10:30	Mid-morning supplementary lunch. Milk and bananas, varied with crackers.
11:20	Postural exercises for selected groups.
11:40	Health talks in shade by nurses to their individual groups.
11:45	Preparation for dinner. Washing of hands. Assisting, and arranging noon meal.
12:00	Dinner.
1:00 P.M.	Rest period, in sleeping quarters, prone on bed.
3:00	Up and out in open.
3:30	Mid-afternoon lunch, milk and bananas. (Sometimes partly devoted to rehearsal of health plays for demonstration open to public.)
5:30	Assembly for supper.
6:15	Attention to personal eating utensils.
6:30	Play, campfire singing, games, story telling.
7:30	Chilly night, mug of hot cocoa.
8:00	Bed. Quiet.

This schedule was closely adhered to, with the exception of special occasions such as rainy days, when the rest period was prolonged.

The doctor, who was also Camp Director, made a daily visit to the camp, and frequently a second one in the evening. Daily medical inspection by the nurse in charge of each group was religiously carried out. Any children showing a rise in temperature or malaise were immediately quarantined, their personal effects segregated, all contact with the rest of the camp severed as far as possible, and measures against the possible spread of contagion, such as throat cultures, immediately taken.

MEANS TO HEALTH

Heliotherapy—The sun treatment was carried out in accordance with the most approved technic. The children, after becoming accustomed by increasing dosage to the direct rays of the sun, were gradually divested of clothing until only trunks were worn. This also had for its purpose what is almost as important as the sun bath, that is, the air-bath, to as much of the surface of the body as possible. In carrying out the sun treatment, careful watch was kept for the possibility of over-dosage and no untoward effects were noticed. A deep pigmentation of all those at camp was secured (Figure III).

Rest and Recreation—While recreation is of major importance in the summer health camp, these children, undernourished and underweight, need rest rather than strenuous exercise, because one of the important factors in bringing about this condition is over-fatigue, to which the child of school age is highly susceptible. The problem is to correct this over-fatigue and neutralize the toxic fatigue products. This can be done only by rest, and by this is meant complete relaxation, prone on bed or cot, as provided for in the daily schedule.

This chronic fatigue of the school child is usually due to lack of sleep, faulty food or health habits, and poor home hygiene, intensified often by too much outside work. It is also a fact that sometimes, because of the compulsory education law, the child is required to spend a large part of his waking day within school walls under more or less strict régime and at definite tasks, deprived of the fresh air and sunshine which he enjoyed during his preschool period. For this reason stress was placed on the length of the daily rest period.

Diet—Faulty diet plays a far greater part than was formerly supposed in bringing about not only malnutrition in children but also the degenerative diseases of adults. The ills due to a partially deficient diet, that is, one deficient in such mineral salts as calcium, the vitamins and the essential amino-acids, are of frequent occurrence.



FIGURE VII—Group which includes some of the most needy children taken at the end of the first 16 days. Children Nos. 2, 3, and 4 unfortunately left before the end of the camp session. They returned to school not improved.

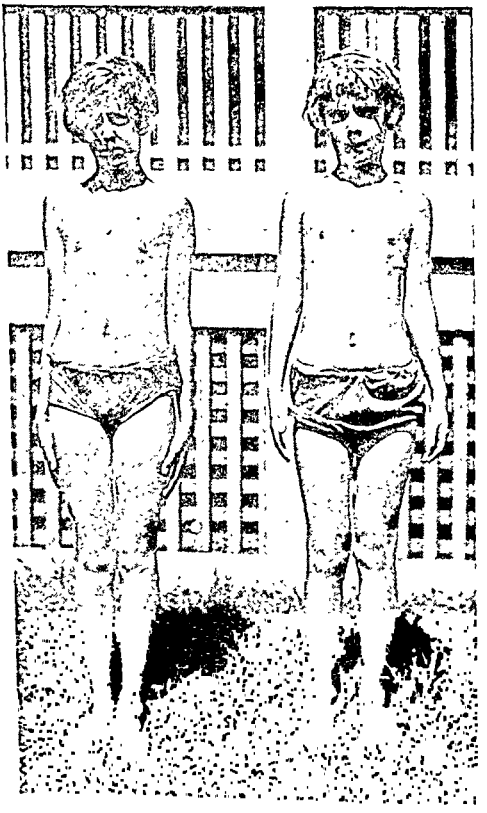


FIGURE VIII—Florence P. and Lucy N., the two children at the right in Figure VII at the close of camp. The marked improvement in posture and good effect of the sun treatment are readily seen. Their records are:

NAME	AGE	HT.
Florence P.	12	57
Lucy N.	10	56½

	WEIGHT BY WEEKS								
NAME	1st	2d	3d	4th	5th	6th	7th	8th	Normal
Florence P.	64½	70½	72½	72½	74	75	75	76½	82
Lucy N.	62½	63½	65½	67½	69½	72	72½	74½	78

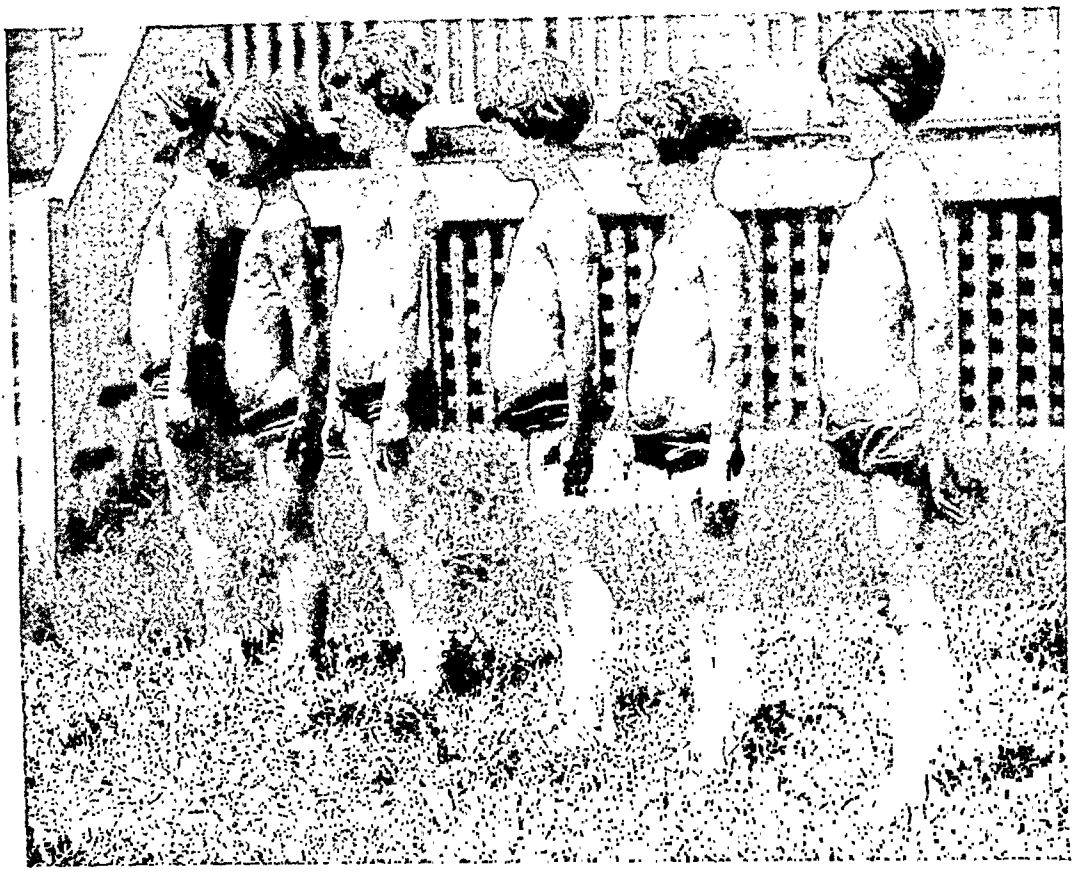


FIGURE IX—Group taken at end of the first 16 days. Their records are:

NAME	AGE	HT.
Jennie G.	9	53
Gladys K.	10	47½
Mary F.	Left	
Grace C.	9	47
Theresa B.	7	44½
Delia G.	Left	

WEIGHT BY WEEKS

NAME	1st	2d	3d	4th	5th	6th	7th	8th	Normal
Jennie G.	52½	54½	56½	57	57½	59	59		67
Gladys K.	45½	47½	48½	50	51½	52½	52½	54	50
Mary F.	Left								
Grace C.	44½	44½	45	47½	47½	49	49½	50	50½
Theresa B.	40½	42½	Tonsil-lectomy	43½	45½	47½	48	50	45
Delia G.	Left								

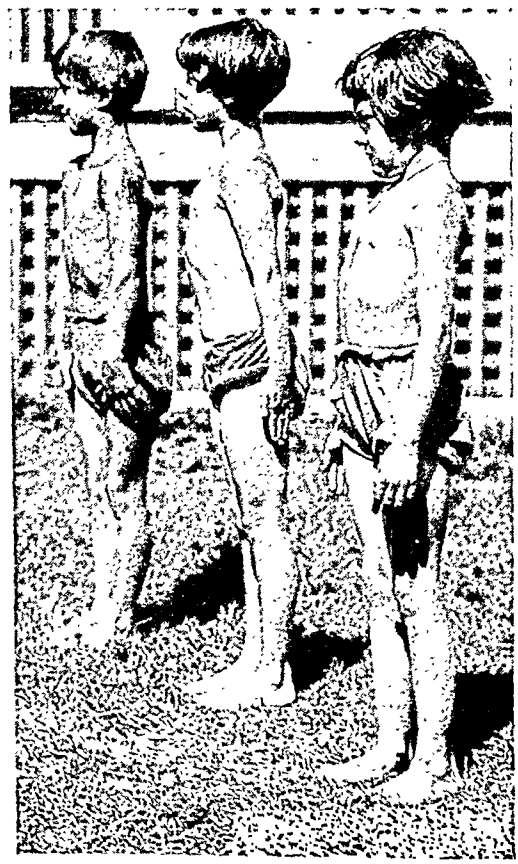


FIGURE X—Three who remained of group shown in Figure IX at the end of camp—Gladys K., Grace C., and Theresa B. While the posture may seem exaggerated, it shows an excellent appreciation of what constitutes correct posture, when on display.

Although the economic condition of the family may be a factor of considerable importance in bringing about such faulty food habits as result in malnutrition, nevertheless equally important is the lack of knowledge of what constitutes a correct and balanced diet. One result is that fickle food habits and unwarranted prejudices against certain essential foods are allowed to exist in children, and because of these, improper and inadequate diets for normal growth are found not only among the poor but even in the homes of the wealthy. As regards children, diet is in the main a matter of health education.

For these reasons careful attention was paid to this phase of the work. Not only was the daily menu compiled with great care, and attention to the requisites for nutrition and growth, but foods were chosen and menus arranged in such a manner that they could be provided and served in the homes to which these children would return. The purpose was to secure a correction of faulty food habits which might be continued after the children returned home.

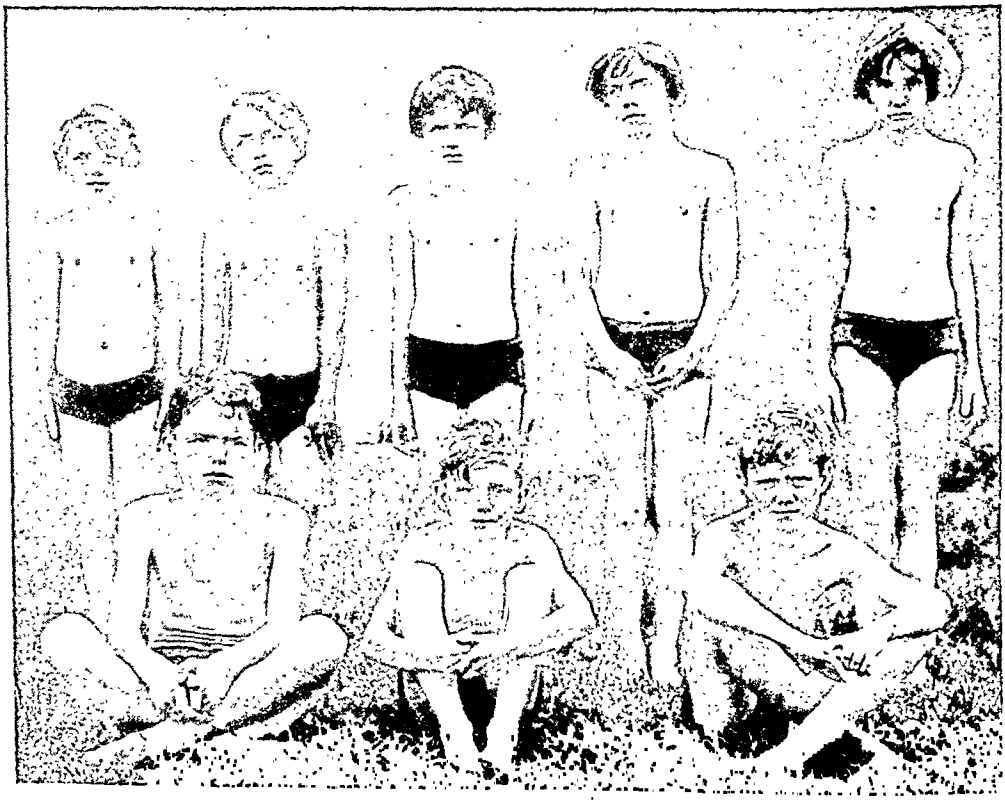


FIGURE XI—A typical group at the end of the first 16 days. Their records are:

NAME	AGE	HT.	WEIGHT BY WEEKS								
			1st	2d	3d	4th	5th	6th	7th	8th	Normal
Grace C.	9	47	44½	44½	45	47½	47½	49	49½	50	50
Gladys K.	10	47½	45½	47½	48¾	50	51½	52½	52¾	54	50
Agnes Mc.	10	50½	50½	52¾	55¼	55¾	56½	58½	58½	60½	56
Eleanor W.	10	53¼	59½	63¼	64	66	66½	67½	68½	69½	68
Mildred M.	10	55	65½	64½	65	66	66	67½	66½	68¾	74
Stanley R.	12	59	80	80½	83	84	85	84½	86	86¾	89
George M.	8	50	54½	53¾	54¾	55¾	56½	56¼	56½	57	58
John O'C.	11	56¾	66½	68	69½	70	72	72	72	73	74

Since this phase of the work was essentially educational and its success depended upon continuity and perseverance of effort, certain follow-up work was necessary. The parents of these children were supplied with a mimeographed sheet containing a list of foods for breakfast, dinner, supper and the between-meal lunches, such as were given at camp, and which contained the necessary nutritive elements for child growth. This list is almost identical with that furnished by the State Department of Public Health.

Milk and bananas were chosen again this year as a supplementary lunch, not only because they furnish a complete food when used together, due to the fact that the ratio of carbohydrates and fats to proteins makes a well balanced diet, but also because the ripe banana is palatable and easily digested and assimilated. The combination also contains adequate amounts of vitamins A, B, and C, and the essential mineral salts. This choice of a milk and banana diet was due not only to its adequacy as a supplementary lunch for those children who were in special need of extra nourishment, but also to create a taste for a palatable food which might replace concentrated carbohydrates in the form of candy, or other sweets, between meals.

SOME HEALTH CAMP MENUS

Sunday

Breakfast	
Oranges	Sliced banana
Shredded wheat	Shredded wheat
Bread and butter	Pep
Milk	Bread and butter
	Milk
Dinner	
Chicken fricassee	Pot roast
Mashed potato	Baked potato
Green peas and onions	Peas
Milk and ice cream	Bread and butter
	Ice cream
Supper	
Chicken soup	Sandwiches
Baking powder biscuit	Canned pears or peaches
Banana and peach salad	Milk and cookies
Milk	

Friday

Breakfast	
Stewed prunes	Oranges
Sliced banana	Oatmeal
Pep	Bread and butter
Bread and butter	Milk
Milk	

Dinner	
Fish chowder	Fish chowder
Bread and butter	Green corn
Milk	Banana fritters
Stewed peaches	Peanut butter sandwiches
	Milk
Supper	
Tomato soup	Banana salad
Boiled rice	Bread and butter
Fruit salad	Milk
Bread and butter	Cream of pea soup
Milk	
Saturday	
Breakfast	
Oatmeal cereal	Dried peaches stewed
Sliced banana	Pep
Milk and top milk	Bread and butter
Bread and butter	Milk
Dinner	
Meat loaf	Pea soup
Mashed potato	Spinach
Brown gravy	Junket
Creamed carrots	Bread and butter
Banana and cream souffle	Milk
Bread and butter	
Milk	
Supper	
Baked beans	Scrambled eggs
Corn cake	Blueberry cakes
Milk	Bread and butter
Banana pudding	Milk and bananas

There were also mid-morning and mid-afternoon lunches of bananas and milk, sometimes varied with crackers. On chilly nights hot cocoa was served at 7:30. The children were not permitted to receive or accept gifts of food.

THE EDSON SCHOOL HEALTH CENTER

Inaugurated in 1927 and financed by the Lowell Tuberculosis Council as an experiment under the supervision of the Director of School Hygiene, the Health Center at the Edson School has developed into an important phase of municipal health activity. Its success warranted the appropriation of additional funds from the Council for the expansion of the work the following year.

A director without pay and a full-time nurse with salary, assisted by several volunteer workers, formed the personnel of this center, which was conducted 5 days a week with morning and afternoon

sessions, beginning at 9 and closing at 4:30. The average attendance was 125. Weighing and measuring, with physical examination of all children enrolled, was done and recorded on admission. The daily program included mid-morning and mid-afternoon lunches of bananas and milk, postural and corrective exercises, health education by daily talks, health plays and pageants and such activities as making health posters, illustrating nutritious foods by cut-outs from advertisements and pictures, with toothbrush drills and instruction in personal hygiene. In addition to this, on certain days each week, diphtheria prevention work was carried on by a volunteer corps of physicians assisted by health department nurses, through the administration of toxin-antitoxin to children of preschool and school age. Infant welfare work was carried on under the supervision of a pediatrician, and consultation with an eye, ear, nose and throat specialist was provided for all cases requiring it. The fact that on various occasions 40 or 50 parents visited the center in one day, and that many notes and inquiries were received concerning their children's health, showed that this clinic was making contact with groups heretofore difficult of approach, and that these groups were being enlisted under the banner of good health.

Supplementary lunches were provided, consisting of a ripe banana and a pint of milk morning and afternoon, varied occasionally by crackers and ice cream. The completeness and nutritive value of this food as a supplementary lunch to the ordinary meals was evidenced by a gain in weight of from ¾ to 2¼ pounds during the period that the health center functioned. (Figure IV shows the morning lunch.)

Amazingly good discipline was evidenced at both health center and camp. In the few instances of infractions of camp rules, just penalties were inflicted immediately, and took the form of increased rest periods, even up to an entire 24 hours in bed.

These were few but noteworthy. We regret that several of our most needy cases stayed but a very short time, due in part to inopportune visits from parents either alone or accompanied by former playmates of the children, or members of the same family of about the same age, during the first week of camp. These visits, coming at the only time when the children felt any homesickness, caused a few to return prematurely to their homes. Others, because of ignorance on the part of the parents, were taken from camp on refusal of the authorities to allow the children or visitors to go and come when they pleased. A signed agreement from these parents guaranteeing a stay of 8 weeks would have eliminated these difficulties.

Finances for this type of camp were voted by the health department, due in no small part to the popular demand created by the Lowell press in timely publicity and endorsement of the value of this work, and through the sponsorship of certain agencies actively concerned with community health and civic welfare, such as the Lowell Tuberculosis Council, the Lowell Chamber of Commerce, and many of the city officials.

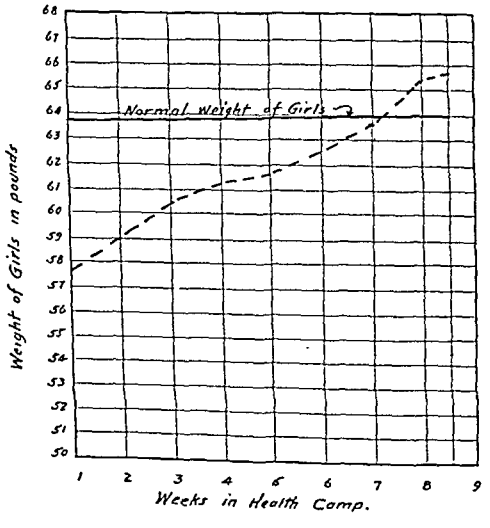
The success of the camp was due to a great extent to the men forming the Lowell Board of Health. Awake to the great possibilities of this work in improving the health of the children, they rendered every assistance possible to the Director of School Hygiene.

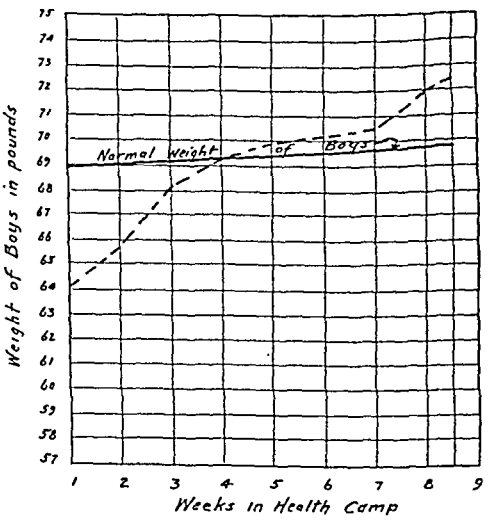
RESUMÉ OF WORK ACCOMPLISHED

The beneficial results of the summer session of the Lowell Health Camp were threefold.

1. Improvement in the physical condition of the children was evidenced by an average gain in weight of over 7 pounds; a bright and happy appearance as contrasted with an apathetic and listless attitude on entrance; vigorous activity; improved muscular tone; a skin healthy in appearance and firm to the touch, with a deep pigmentation of practically the entire body; better posture, with a lessening of the fatigue posture characterized by "winged" shoulder blades, curved back and marked ptosis of abdomen common to practically all at the time of entrance; and the ability and willingness to eat the simple, correct and nourishing foods which comprised the camp menu.

COMPOSITE WEIGHT CHARTS





2. The acquisition of considerable health education was shown by a voluntary adherence to the precepts of personal hygiene, such as cleanliness of face, hands and body, improved oral hygiene, attention to appearance, and care of personal property. In addition, every child had a positive knowledge of what constituted a correct diet and an appreciation of the value of fresh air, sunshine and sufficient rest.

3. There was inculcated a very definite respect for constituted authority and for the rights and privileges of the other members of the camp, which, together with a healthy body and a sound mind, are the qualities which go to make a desirable and welcome future citizen.

VALUE AS A HEALTH DEMONSTRATION

For the success of any program intended for the betterment of child health the coöperation of the public is necessary, and to secure this an educational health crusade must be promulgated. In gaining this appreciation and coöperation, such demonstrations as summer health camps and summer health centers are very efficient agents, the more so because, generally speaking, health departments are handicapped by the failure of the adult population to recognize in their work something of immediate and tangible value to themselves. The success of these health programs depends to a great extent on the amount of health education " sold " to the public. It is not too far-fetched to say that preventive medicine as a whole is three-fourths educational.

No better form of advertising for any city is possible than the knowledge that the health of its children—the future citizens—is receiving the consideration and attention which it should. Disraeli once said: " Public health is the foundation on which rests the happiness of the people and the welfare of the state." It is to the credit of the city of Lowell that it maintains for its undernourished children perhaps the only, and certainly one of the very few, municipally financed summer health camps in the United States.

The Outlook for Mortality Statistics by Occupation*

LEON E. TRUESDELL, PH.D.
Chief Statistician for Population, Bureau of the Census, Washington, D. C.

OCCUPATION is one of the factors which determine the death rate; a double factor, made up of the direct hazards, which affect only the worker, and of the attendant living conditions, which affect both the worker and his family. The presentation of adequate statistics of deaths classified according to occupation ought, therefore, to form a part of any comprehensive program for vital statistics. It remains to determine at just what point this feature should be taken up, for there are many other items, some of them of much more immediate importance, and nearly all of them easier of accomplishment. The logical procedure would seem to be to let the matter of occupational classification wait until the more urgent features had been established, or were well on the way toward a satisfactory status.

The census reports of 1890 and 1900 gave considerable space to the classification of deaths, not only by occupation, but by occupation with age and cause of death, but the mortality statistics up to this time were very imperfect. The reporting of deaths by the census enumerators had failed to obtain even the total number. The transcription of state records in a limited registration area had been used to supplement the enumerators' work in 1880 and 1890, but the idea of extending this method and making it the basis for annual statistics of mortality was only taking definite form in 1900.

For the 25 years following 1900 the main effort of those in charge of collecting vital statistics for the United States was directed to the extension of the registration area and the improvement of the returns both in quality and in completeness. In 1915 the compilation of birth statistics was begun and a birth registration area established. This met a need far more urgent than any amplification or further classification of the death statistics.

Gradually, states have been added to the registration areas for deaths and births, 44 being now included, with about 95 per cent of

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

our population; and for most of this territory the number and causes of deaths are satisfactorily reported. We may now divert a bit of our time to classifying the death returns by occupation.

The first thing is to find out what materials are at hand and to what extent they are in shape to meet the new requirements. Tabulations of deaths classified by occupation have been made for some of the years between 1900 and the present. Tables of deaths classified by occupation were published in the reports for 1908 and 1909, though without any rates, since parallel figures for population were not available for years so long after the census year. In 1910 the tabulation was again made and rates were computed; but the results showed so much inconsistency and so many relations that did not seem reasonable, that the tables were never published. The experiment was repeated in 1920, with results still unsatisfactory. These attempts establish the fact that the disinclination of the U. S. Bureau of the Census to publish occupational mortality figures under present conditions is based on a realization of the imperfections in the material rather than on inertia or lack of appreciation of the importance of the subject.

For the computation of death rates for occupational groups, two kinds of material are needed: deaths classified according to occupation, and population data classified in the same way. The occupational classification of the two factors must be made, so far as possible, on a uniform basis. Any adequate interpretation of the death rates when computed requires also some age classification; for in many cases a high death rate for a given occupation taken as a whole will appear upon analysis to be primarily the result of the high average age of the persons engaged, or *vice versa*. The death rate for farm operators, for example, will certainly be far higher than that for farm laborers, because the latter are mainly young men. Some classification by cause of death will also be needed, since the influence of occupation on mortality frequently takes the form of an increased (or decreased) likelihood of death from certain specific diseases.

One of the principal difficulties in compiling occupational mortality statistics is that of securing accurate returns on the death certificates. A recent examination of more than 1,500 certificates, selected from representative areas, showed that only about 70 per cent contained occupation returns sufficiently complete for a satisfactory classification. Among the inadequate returns the most common defect was the entry of some indefinite term, such as " clerk " or " laborer," without any statement as to the industry or business. While information as to the industry is not absolutely required in all cases, it is essen-

tial to the classification of laborers and some other groups of workers; and there seems to be no way of insuring its presence when needed, except to insist on having an answer to the question covering this point on all certificates.

The occupation returns on the general census schedules are not all complete and satisfactory, but the proportion of unsatisfactory ones which have to be given an arbitrary classification or thrown into some residuary group is much less than 30 per cent. Entries in other parts of the schedule, and for other members of the family or residents of the locality, often prove of material assistance in classification, where this is made for the whole population. Such assistance is entirely wanting, of course, in the isolated cases represented by the death certificates.

The occupation returns on the death certificates ought to be at least as accurate as those made by the enumerators on the census schedules. In both cases the information is usually obtained from members of the family. The undertaker, physician, or other informant is probably more intelligent and more accurate than the average census enumerator; further, he is recording information with regard to occupations almost daily and not, as in the case of an enumerator, for a brief period once in 10 years.

The two primary occupation questions on the standard death certificate are similar in a general way to the corresponding ones on the population schedule, but there are minor differences in form; and these may be in part responsible for the less satisfactory returns on the death certificate. The occupation questions on the death certificate are as follows:

8. OCCUPATION OF DECEASED
(*a*) Trade, profession, or particular kind of work .....
(*b*) General nature of industry, business, or establishment in which employed (or employer) .....
(*c*) Name of employer .....

For the sake of making the death certificate uniform with the population schedule it is proposed to revise this section to read as shown on the next page—substituting two new questions (numbered 10 and 11) for the "Name of employer," which seems to serve no particularly useful purpose:

OCCUPATION	8. Trade, profession, or particular kind of work done, as *spinner, sawyer, bookkeeper,* etc. ..... 9. Industry or business in which work was done, as *silk mill, sawmill, bank,* etc. ..... 10. Date deceased last worked at this occupation (month and year) ..... 11. Total time (years) spent in this occupation .....

It is believed that the listing of specific examples of the kind of entries desired under both trade and industry will make clear the requirements for these two questions in many of the cases where the distinction has not been clear heretofore, and that the importance of answering both will be more evident if they are given independent numbers, " 8 " and " 9," in place of being presented as subdivisions " (a) " and " (b) " under a general designation.

More serious than these minor differences in the form of the inquiry on the face of the standard death certificate would seem to be the statement in the instructions on the back: " For many occupations a single word or term on the first line will be sufficient." This is followed by an explanation of the fact that in other cases entries are required both on the first line (trade or specific occupation) and on the second line (industry); and if the instructions, as they stand, were followed absolutely, the results would be satisfactory. The inevitable psychological effect, however, of the statement quoted, has been the return of numerous certificates with entries on the first line only, even though the cases were plainly included under specifications printed later in the paragraph and definitely calling for a second entry. It is believed, therefore, that a radical revision of the instructions, putting stress at the very beginning on the necessity for reporting both specific occupation and industry, coupled with the proposed changes in the form of the questions, will result in a great improvement in the returns; and that if this is accompanied by special emphasis on the necessity for making complete and accurate returns of occupations, the data will soon be in satisfactory form.

The new section proposed, including questions 10 and 11, need occupy no more space than does the occupation section on the present standard form. Question 10 is added as a basis for separating retired persons from those actively engaged in the occupation returned up to the time of death or the beginning of the illness which resulted in death. It is believed that a definite question like this will give more satisfactory results than any provision for returning persons as " re-

tired." Question 11 is designed to give some information with regard to change of occupation, which is probably more frequent among American workers than among those in any other country.

Since it will doubtless be expedient to start the publication of occupational mortality statistics in a relatively small way, rather than to undertake to cover the whole field in the first year, it has been suggested that for a time the presentation be limited to statistics for males; and even to those for males 20 to 64 years of age.* The connection between occupation and mortality is far more direct and important with males than with females, since 92.6 per cent of the male population 16 years of age and over are gainfully employed, as compared with 23.9 per cent of females. The connection is doubtless far closer with males within the suggested age limits than with either those under 20 years or over 64; for the former have had only a brief experience in any occupation and the latter are approaching that period in life when death is imminent, no matter what the occupation may be. Another factor which is rendered less serious by the omission of persons over 64, is retirement. Many persons dying in old age will have retired from gainful occupation some years prior to their death, but frequently, in spite of all precautions, the earlier occupation will be reported on the death certificate with no indication of the retirement.

It is proposed to base the occupational death rates on the number of gainfully employed persons regularly returned in the census of population, which does not include retired persons. Presumably, these should be excluded also from the number of deaths used in computing the rates, though this does not necessarily follow. It would seem illogical to include retired persons in the deaths and not in the basic population; but in practice this combination might yield the more significant results. It would take account of one additional factor, the variation in the relative number of deaths from retired status in the various occupations (and from the various causes of death); and except for this the rates would run parallel with those based on the complete elimination of all "retired" cases, only on a uniformly higher level.

An alternative plan which has been seriously considered is that followed in the English census, where the attempt is made to include all retired persons,† classified according to the occupation followed prior to retirement, both in the number of deaths and in the population

* The statistics presented in the English report on occupational mortality for 1921 relate mainly to the age group 20 to 65.

† The basic population group under consideration in most of the tables in the English report on occupational mortality is "All occupied and retired civilian males."

groups. This method would perhaps be the ideal one if it were possible to obtain the required information with accuracy and facility. Even in England, where the institution of vital statistics has been established for a much longer period than in the United States, it is admitted that the population statistics for a given occupation fall considerably short of including all retired persons who had followed that occupation.

One of the important considerations in favor of basing occupational death rates on data for the gainfully employed population, exclusive of retired persons, has been that of expediency. The process of classifying the returns of the decennial population census according to occupation is a task far greater than any other one part of the work leading to the publication of occupational mortality statistics. From the beginning, the practice has been to include in the various occupational classifications only those persons actively engaged in the occupation at the time of the census, or temporarily idle on account of failure to find employment. To expand this group to include both the gainfully employed and the retired population would result in some confusion and in somewhat less accurate classifications, in addition to making a material increase in the work.

The requirements of expediency were supported, however, by a feeling on the part of some members of the staff of the Bureau of the Census that death rates based on fairly good data excluding retired persons would be at least as significant as those which might be based on imperfect returns for all persons who had pursued the various occupations, including those retired; and in particular, that the relation between the rates for one occupation and another would be typical and significant.*

Further, in spite of the English precedent, there is ground on which we might question the validity of including both retired and occupied in one total and treating the combination as a unit in computing death rates. In many occupations the death hazard of those at work is decidedly greater than that of those who have retired for reasons other than disability resulting from the occupation. This is especially true in occupations where the likelihood of accident or the results of exposure are important factors, as, for example, coal miners or telephone line men. Retirement on account of disability would usually connote an increased likelihood of death. In either case there is reason for insisting that the two groups should not be mixed—that if statistics

* These relations would not be identical, of course, because of the variation in the relative numbers of persons retired from the various occupations; but one might contend that while two curves representing the two sets of rates for a series of occupations, one based on the occupied population and one on "occupied plus retired," would not run absolutely parallel, they would correspond rather closely in their major ups and downs.

are to be presented for the retired, they should be kept entirely separate from those for persons actively employed. Here is a field in which we ought at least to do some preliminary experimental work, so as to know positively what will be the effect of combining these two elements.

Something like this is what we have in mind for the immediate future program in the Bureau of the Census. It is proposed to make a careful study of the extent to which occupations are normally returned for retired decedents, which will be indicated by the replies to question 10 (date of last active employment) in the revised form of the death certificate. It is proposed also to make a study, on the basis of the replies to question 11 (total time spent in this occupation), of the extent to which men change their occupation, giving especial attention to the changes taking place after middle life, which may prove to be a more serious disturbing factor in American statistics of occupational mortality than the matter of retirement. On the basis of definite information secured from these studies, it will be possible, as the work develops, to make any changes in the general plan that may seem profitable.

One further limitation imposed by the dictates of expediency will restrict the value of the occupational mortality statistics which can be compiled in the immediate future. Many of the occupation classifications now employed represent so large a group of specific occupations, including persons working under widely different conditions, that they will not bring out in any positive fashion the effects of occupational hazard. In fact, it seems likely that for the first few years the really significant occupational mortality figures will be the rates for a relatively small number of occupational groups, including those in which the conditions of employment are relatively uniform and those which by reason of a definite and universally used occupation designation will be most accurately returned both on the population schedules and on the death certificates. The first stages of improvement will come with the gradual increase in the accuracy of the occupation returns. Later, when the social value of these figures has been demonstrated, it may be possible (and justifiable, in spite of the expense) to make extensive subdivisions of the present occupation groups to segregate those classes subject to particular occupational hazards. The major consideration at the present time, however, would seem to be the formulation of a program which is simple enough to be immediately practicable, and which will at the same time provide enough detail to be of positive and appreciable value.

A Swan Song in Public Health Work

EMERY R. HAYHURST, M. D., FELLOW A. P. H. A.

Ohio State University, Columbus, O.

IN THE midst of the controversies of the day as to how much we are really gaining or losing in the fight against disease and the raising of the level of life for mankind, it is a bit of relish indeed to pick up the report of a man retiring from the active field of public health work, who was in at the beginning of the century, who kept faithful records through the intervening years, and in a simple short story now publishes the results.

In February, 1901, Dr. Richard King Brown took office as the first full-time Medical Officer of Health of the Borough of Bermondsey, England, a populous section of London, S. E., and his *Annual Report of 1927* to the Mayor, Aldermen, and Councillors closes a long and noteworthy official career.

Many changes have occurred in public health during this first quarter of the century, and Dr. Brown says that the advances have not occurred gradually, but by leaps at more or less well defined periods. The changes have been partly local, that is, confined to the borough itself, and also partly local expressions of national changes. A single table in the forepart of his report speaks volumes, and shows the important changes year by year from 1901 to 1927 inclusive.

Beginning in 1901 with 130,760, the borough, in 1927, had a population estimated at 121,000, composed of 29,284 families located in 18,034 houses. The reduction has been very largely due to the pulling down of certain buildings for improvements, but also to the replacement of houses by factories and the reduction in the birth rate, as well as to migrations to the suburbs.

The death rate has been reduced not quite by half, that is, from 20.8 to 12.9, and, while annual fluctuations have been marked, Dr. Brown feels quite safe in saying that the reduction is likely to be permanent. A more remarkable reduction is that of the birth rate, that is, from 34.2 per 1,000 in 1901 to 18.5 in 1927, and this also seems to be of permanent character, and by no means an unmitigated evil, because it has been paralleled with a marked reduction of infant deaths, and there is surely a correlation between the two.

The reduction in the infant mortality rate is considered to be

due chiefly to the reduction in the size of families. The very large families—10 to 15 and upwards—were not able to take good care of infants and the loss of a few was not looked upon as very serious. Families were huddled together in overcrowded houses, the result being that infectious diseases, particularly pneumonia and bronchitis, played havoc among the children. Another cause for reduction in the rate is probably the education of the mothers in taking care of infants, and this must be partly due to the rise of general education, and the special education undertaken by the municipal authorities and voluntary bodies under the stimulus of the Maternity and Child Welfare Acts. Other contributory causes, no doubt, are the rise in the rate of wages and the cheapening of food, but Dr. Brown thinks the first two causes mentioned have played a great part.

Very satisfactory reduction in tuberculosis, enteric fever, and smallpox is noticeable, but there seems to be no very material change in the prevalence of scarlet fever and diphtheria; in fact, they are inclined to increase, and the only thing that can be said of scarlet fever is that the form of the disease is much milder in this later day. We note no comment in Dr. Brown's report regarding immunization against scarlet fever or diphtheria; so in all probability his statements refer more or less to the natural status of these diseases left to the usual quarantine procedures. There was a serious outbreak of smallpox of 331 cases in 1901–1902, but since 1904 there have been altogether only 6 cases of this disease. Puerperal fever still remains a serious problem, and no doubt in the near future some method of reducing the mortality will be found.

Most interesting changes have taken place in the general condition of the inhabitants, especially the working classes, who now dress better and much more sensibly, and possess much greater general knowledge, especially in relation to health. There has been great improvement likewise in the cleanliness, ventilation, and general appearance of the homes.

Greatly increased sobriety prevails. There is no question that drinking is much less prevalent than it was 27 years ago. The appearance of a drunken man in the streets, which was by no means uncommon in 1901, was extremely rare in 1927. Here again, education has probably played the chief part, says Dr. Brown, though, no doubt, high taxation of alcohol, as well as the restriction of the list of sale, has had something to do with it. This condition should be looked upon as a great gain, and it can confidently be assumed that the population will be much more sober in the future, brought about, not by oppressive legislation, but by increased education.

The health department itself has been subject to important changes, from that of a part-time medical officer in charge, with a few assistants, to a department which is now composed, in addition to the Chief Medical Officer, of 7 sanitary inspectors; 7 district inspectors; 2 tuberculosis officers, assisted by 4 nurses and a caretaker; 2 medical officers for maternity and child welfare, assisted by 8 women health visitors; 1 full-time and 1 part-time dental surgeon, with 2 dental nurses and 3 prosthetic assistants; a convalescent home with a matron and nurse (with the admission of 255 women, 126 babies and 119 toddlers during the year); a public analyst; and a clerical staff consisting of 12 persons, in addition to a mortuary keeper, and a foreman disinfector. Some idea of the nature of the work of the department at present can be gained by a glance at this list of officers.

An interesting sideline has been a liaison with Dr. A. Rollier of heliotherapy fame, Leysin, Switzerland, by which not only were 6 beds for patients from the London Borough reserved there, and more or less completely occupied since July, 1924, but a solarium was also opened in the district itself in July, 1926, which proved of great benefit. Practically all of the patients are recommended for treatment in the solarium by the doctors from the various maternity and child welfare centers and from the tuberculosis dispensaries or hospitals. It is the first municipal solarium on any considerable scale in England, and has had visitors from all parts of the world. The attendance in 1927 totalled 24,322, examinations 2,226, new patients 456, maternity and child welfare patients 265, tuberculosis patients 107, and other classes of treatment 322. On the whole, cases of rickets and malnutrition have done well and shown very rapid improvement. The same may be said of antenatal cases, and the majority of these have returned after confinement for further treatments. There is little doubt about the value of light treatment in surgical tuberculosis if given cautiously, and none of the 18 cases of pulmonary tuberculosis treated has so far been injuriously affected, and in one or two cases the results have been gratifying.

Not an inconsiderable part of the detail work of the Health Office has had to do with the inspections of factories and workshops. During 1927, 630 such inspections were made in the district. Scores of defects in cleanliness, ventilation, sanitary accommodations, and other nuisances were found and remedied in the 413 workshops on the registry. Certain matters were referred to H. M. Inspectors of Factories and others were administered by the department itself. Observations upon smoke nuisances have formed a part of the health department's routine, with the filing of notices and summonses.

Among the later activities of the department has been health education, or propaganda, which was set up on a more extensive scale in July, 1924. The department has published a series of articles; given lectures in the open air, at schools and clubs; and, after investigating the films on the market, decided to make its own, which has proved very successful. The war opened the eyes of the nation to the value of public health work, as is shown by the tremendous and unremitting interest which the council now takes in the department.

It must surely be a satisfaction to the venerable Dr. Brown to submit an annual report of this nature as his epilogue, while health officials in America may well take heart and profit from his endeavors.

The gains described by Dr. Brown, sometimes enormous, can hardly be attributed to other than society's organized battles against disease and ignorance. Even the geneticists must acknowledge that no amount of natural selection or inheritance could bring about in one generation results such as these. We are pleased to note that even in a crowded section of London, and despite the vicissitudes of wars, unemployment, and traditional hindrances, none of which we can fully grasp in this country, even better progress has resulted than with us, and a part of it with less stringent laws. Detailed regulations are a characteristic of British procedures. There is, however, this marked difference in the British and the American methods—the former grasps the economic issue early and sees the wisdom of sidestepping politics in fundamental matters and of giving sound support in men and money to the projects which present themselves.

Leprosy Treatment

THE treatment of leprosy at the National Leprosarium, Carville, La., is progressing favorably. What is ordinarily considered cure, though not so designated by the authorities, is an accomplished fact.

In the seven years since federal acquisition, 31 patients have been discharged from the hospital—3 as not having been lepers and 28 paroled as "leprosy arrested and no longer a menace to public health." Of these 28, 1 (or 3.6 per cent) suffered a relapse and was readmitted, 4 having died (2 were examined at autopsy without tangible evidence of leprosy being found), and 23 are living and well and report periodically for reëxamination. The average age at which parole began was 44.8 years, and the average period of hospitalization was 6.4 years.

Of 718 hospitalized during 34 years, 215 were foreigners, 503 natives of the United States—418 came from Louisiana, and the others from California, New York, Texas and Florida.

Lead Poisoning in the United States*

TO YOUR committee it appeared desirable that its work be divided into two parts. The first is given over to an uncritical compilation of publications related to lead poisoning not limited to this country, since foreign achievements inevitably influence the incidence and control of lead poisoning in this country.

The second part is devoted to a number of unrelated items pertinent to the status of lead poisoning in this country during but not confined to the specified period.

THE DIMINUTION IN THE INCIDENCE OF LEAD POISONING

Several publications have commented upon the diminishing numbers of lead poisoning cases and deaths. Any proper estimate must recognize that the production and use of lead in this country is now more than double that for 1900, and the first decade of the century. In 1900 the production was 270,824 short tons; in 1927, 687,273; and 1926, 708,147 short tons. In view of this marked increase in lead manufacture and use it might be inferred that a correspondingly large number of workmen are exposed. This probably is not true for trades well established about 1900, and continuing to the present. In 1899, 8,751 workers produced 208,466 tons of lead, while in 1925, 6,115 produced 651,000 tons. In 1900 there were 277,541 building trade painters, in 1910, 273,441, and in 1920, only 248,897 (Census Report). Comparable figures for the period covered in this report are not available. From the figures it is reasonable to assert that the actual number of workmen exposed to lead may be less than in either 1900 or 1910, notwithstanding the extension of newer trades, such as automobile storage battery manufacture.

It is upon this type of information, rather than upon any precise and comprehensive records, that claims as to decrease in the number of cases must be predicated. In addition, your committee accepts as contributory factors in the assumed lowered incidence of severe or fatal lead poisoning:

1. Frequent physical examinations of lead workers required by law in some states, and voluntarily introduced by some industries and labor organizations

* Abridged report of the Committee on Lead Poisoning (year ending June 30, 1928), presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

2. The recognition of lead poisoning in its early stages, which permits of treatment under ambulatory conditions, without loss of time from employment

3. The development of improved types of machinery, such as the enclosed electrically heated Mergenthaler linotype

4. The improvement in substitute paint bases, such as lithopone, until they are essentially as acceptable as white lead or other lead compounds

5. Generally better working conditions throughout the lead using industries

6. Shortened exposure periods through shortened work periods

This committee believes that the incidence of lead poisoning is far higher than is commonly believed or reported to state departments of health, compensation boards, etc. One state official expresses the opinion that his records represent not more than 5 per cent of the cases. Of 208 cases reported during the past two years, the majority originated in a few plants which had become much interested in plumbism; only 2 cases among painters were included. In another state, in approximately the same period of time, 54 cases occurred among painters and decorators, notwithstanding the fact that fewer persons were engaged as painters. This assumption of a greater incidence of lead poisoning than reported is further borne out by the special physical examinations of those engaged in hazardous lead work. Such investigations frequently reveal large numbers of mild or obscure cases which otherwise probably would never have been diagnosed. In one plant in Nashville, Leathers and Morgan found that 26 of 39 workers in an enameling plant showed lead poisoning.

This committee believes that the intake of lead in small quantities is widespread among the workers of many lead using industries. This may be followed at no subsequent time by the clinical condition known as lead poisoning. There are some reasons to believe that remote degenerative diseases may be influenced as to time of development and severity by lead in amounts below the threshold of clinical response. In the absence of exact data, we regard the control of limited lead hazards as desirable.

The incidence of lead poisoning has not been so lowered that any negligence on the part of the industrial hygienist is warranted.

INDUSTRIAL COMPENSATION

Only 11 states provide for compensation and medical relief for those exhibiting lead poisoning: New York, Maryland, Illinois, Wisconsin, North Dakota, New Jersey, Massachusetts, Connecticut, Minnesota, Ohio and California.

With few exceptions all states have provided compensation and medical relief for industrial injuries. Although the disability from lead poisoning may be as genuine as that from the more obvious injury,

this, with other occupational diseases, leads to neither compensation nor medical care through direct provision, except in the above mentioned states. In a few states not providing coverage for occupational diseases, lead poisoning has from time to time been held to be an accident, and therefore compensable.

This committee maintains that if the practice of providing compensation and medical relief for industrial injuries is sound, similar measures should be provided for lead poisoning, and for all other characteristic occupational diseases.

SHORTENED WORK PERIODS AND PREFERRED REMUNERATION

It has appeared that some units of organized labor are disposed to base claims for shorter hours and increased remuneration upon the hazards of work. It is argued that if trade processes entail dangers to exposed workmen, the risk will be diminished if a lessened exposure, such as a 5-day week, takes place. Further, since the employer is responsible for, and a shorter work period is necessitated by, the hazard, payment should be made on the basis of a 6-day week.

Where it can be shown that lead, or other occupational exposure, is a factor in shortening the life expectancy of workers, and if the hazards cannot be eliminated, this committee agrees that such unfavorable conditions constitute a just basis for remuneration in excess of that provided for work in which comparable hazards do not exist, and for shortened work periods, if it may be established that these diminish the probability of the characteristic occupational disease or diseases. It is, however, not in sympathy with the use of health hazards as a basis for complaint merely that the economic status may be bettered. The danger is that no demand or effort will be made to eradicate the hazards—rather they will be cherished as leverage for continued economic pressure.

PRESENCE OF LEAD IN EXCRETA OF APPARENTLY NORMAL PERSONS

Extensive work has been directed to the measurement of lead in the urine and feces of persons not known to have been exposed to lead. It appears that traces of lead may regularly be detected in the urine or feces, or both, from apparently normal persons. The source is unknown—it may include food, food containers, lead foil wrappers, cooking utensils, lead flakes from paints.

In view of such findings, this committee suggests that no great diagnostic significance be attached to the detection of lead in urine in qualitative amounts only. Urinalyses appear to be of value in

the diagnosis of lead poisoning only when quantitative, and the quantity found should be in excess of traces common to practically all apparently normal persons.

The Scientific American has pointed out a new hazard in the substitution of lead oxide or lead phosphate for tin in the weighting of silks. It is not yet established that this new hazard extends beyond the textile worker, to the wearers of leaded silk garments, and laundry workers.

Uttal has traced some poisoning to snuff, through the use of lead chromate for coloring, or lead bearing metal foil for wrapping.

McCord has observed lead poisoning in forging machine workers. In punching holes in solid forged rods, the area is coated with white lead. As the hole is punched, hot lead vapor is formed which is inspired by the machine tenders.

Lead poisoning continues to be this country's outstanding occupational disease hazard.

CAREY P. MCCORD, *Chairman*
DOROTHY K. MINSTER
ROBERT KEHOE *

* Dr. Kehoe, owing to his absence from the country, has not seen this report in its present form.

The Health of German Women in Industry

AT the recent annual meeting of the Society of Industrial Hygiene of Germany, it was stated that 40 per cent of the 6 million women gainfully employed in Germany are married. The combined demands of employment, housework, and the care of the children were considered by some of the speakers as having a harmful effect on the women's health. According to statistics of the sick insurance funds of Germany, membership in which is compulsory for all employed women and girls, the sick rate of their women members is on the average 22.5 per cent higher than that of the men members, and the duration of illness is 3 times as long. Particularly unfavorable is the situation in the textile industry. The incidence of illness among gainfully employed women is from 5 to 8 times as great as among those who are not employed. Particularly frequent are diseases of the organs playing an important part in reproduction.

Because of the above facts, the speakers emphasized in the first place the need of more effective legislative protection of employed young people and women, many of whom are mothers of little children, and secondly the need of welfare work with expectant mothers, infants and older children.—*Jugend und Beruf*, Berlin, Jan., 1929, p. 14.

Status of Silicosis*

SILICOSIS, fibrosis of the lungs due to breathing air contaminated by siliceous dust, is found in many industries and in many states. While it has been known for many years by physicians closely associated with the industries causing the disease, the first systematic study in the United States was made in 1914 and 1915 by Lanza and Higgins [1] among the lead and zinc miners of the Joplin, Mo., district. Lanza examined 720 miners, making a limited number of X-ray negatives of the chest. Of those examined, 179 were free of lung disease; 69 were diagnosed as having more fibrosis of the lungs than normal; 330 had silicosis in some stage; 105 had silicosis and tuberculosis; and 39 had tuberculosis uncomplicated.

Harrington and Lanza [2] made a similar study in Butte, Mont. Of 1,018 miners examined, 432 showed definite signs of injury to the lungs due to dust; 194 had early silicosis and 7 were also tuberculous; 1,128 had moderately advanced or second stage silicosis, 8 of whom were also tuberculous; 110 had advanced or third stage silicosis, of whom 48 were tuberculous.

In 1919, the U. S. Public Health Service published [3] a report on the dust conditions in sand blasting and the efficiency of certain protective devices. The respirator tested was of the ordinary muzzle type with a rubber body fitting over the mouth and nose, and an air filter of two layers of 75-mesh muslin and a piece of sponge about $2\frac{1}{2}'' \times 3'' \times 1''$. The average number of dust particles less than $10 \times 20\ \mu$ when aspirated through this respirator was reduced from 49,400,000 to 4,549,000 per cu. ft. This reduction, while great, was not considered adequate. An aproned helmet, made of cloth covered cardboard having a $3'' \times 4\frac{1}{2}''$ window, was tested with a respirator, and with positive pressure both with and without the respirator. The helmet alone, with positive pressure sufficient to produce a current between 2 and 3 cu. ft. per minute, reduced the number of particles from many millions to a few hundred thousand per cu. ft. When a respirator was used with a helmet and positive pressure, a further material reduction resulted. It was recommended that, where workers must be within sand blasting cabinets, they be protected by helmets with positive air pressure and with respirators of the type described.

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* Report of the Committee presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

In a study[4] of the dust hazard in an ax-grinding factory, it was found that in Connecticut, 1900 to 1918, the death rate due to tuberculosis was about ten times higher among polishers and grinders than for the male population of the state. Winslow and Greenburg[4] quote many authors who recommend wet methods of grinding for lessening the dust hazard. They conclude that wet grinding, as practiced in the factories studied, is extremely dangerous, and that the substitution of dry grinding with an efficient filtering system, or wet grinding on harder artificial abrasive wheels, is clearly indicated as a measure for protection of workers against respiratory disease.

In 1921 a study similar to that in the Joplin and Butte districts was made by the U. S. Bureau of Mines among gold miners of Nevada. Of 303 miners examined, 51 were negative; 8 doubtful; 141 were in the first stage silicosis; 69 in the second; and 34 in the third stage. Among 181 gold miners of California examined in 1921 and 1922, 68.5 per cent were negative; 24.8 per cent had silicosis in some stage; 6.7 per cent were doubtful; and 4.4 per cent had tuberculosis. No sputum examinations were made, as the cases had progressed to such a stage that the condition could be easily determined clinically.

In a statistical study of the granite industry about Barre, Vt., Hoffman[5] found that during the period under observation the mortality from pulmonary tuberculosis increased from 257.7 per 100,000 in 1896, to 953.4 in 1918 (a maximum of 1,330 having been reached in 1916). During this same period, the mortality of the general population declined from 207.5 in 1896, to 96.4 per 100,000 in 1917, excluding, in the case of the granite workers, the last few months of 1918 on account of the influenza epidemic.

The U. S. Public Health Service has undertaken studies planned to cover the entire field of the dusty trades in the hope of contributing to a better understanding of certain unanswered questions.[6] The following were selected:

1. The cement industry, representing calcium dust
2. Silver polishing, representing metal dust
3. The granite industry, representing silica dust
4. The hard coal industry, representing carbon dust
5. The cotton industry, representing vegetable dust
6. Street sweeping, representing municipal dust

The first of these studies has been completed, and the report published as *Public Health Bulletin No. 176.* The investigation was conducted in one of the older, dustier plants, so that the effect of large quantities of the dust could be observed. Records of all absences from work were kept for 3 years, and the nature of disabling sickness

was ascertained. Physical examinations were made, X-ray films were taken, and the character and amounts of dust in the atmosphere of the plant determined.

The results indicated that the calcium dusts created in manufacturing Portland cement do not predispose workers to tuberculosis nor to pneumonia. The exposed workers experienced, however, an abnormal number of attacks of diseases of the upper respiratory tract, especially colds, acute bronchitis, inflammations of the pharynx and tonsils, and influenza. Attacks serious enough to cause absence for two consecutive working days, or longer, occurred among the men in the dustier departments at a rate about 60 per cent above that for the men in the comparatively non-dusty departments. Limestone dust appeared to be slightly more deleterious than cement dust. Outdoor work in all kinds of weather, such as experienced by the quarry workers, appeared to predispose to diseases of the upper respiratory tract even more than exposure to the calcium dusts.

Of 309 miners of the Tri-State District, Picher, Okla., examined by the U. S. Bureau of Mines in 1923, 101 were negative, 114 doubtful, and 94 positive for silicosis; 52 of the 94 were in the first, 22 in the second, and 20 in the third stage. Following this study, a clinic was established at Picher, the building, heating and lighting being supplied by a local organization. The number that could be examined at the clinic was limited, as only one surgeon was available.

In all the investigations referred to, only a part of the men in any industry were examined. The percentage of those found to have silicosis among the men examined was probably greater than for the total number employed, due to the tendency of those who have symptoms to apply for examination, while the apparently healthy worker does not inconvenience himself to come in.

In addition to the physical examination of miners, surveys of the conditions under which they work, especially as to dust, have been made in most of the studies mentioned. Based on the data collected by the physician and the engineer, the following recommendations are usually made:

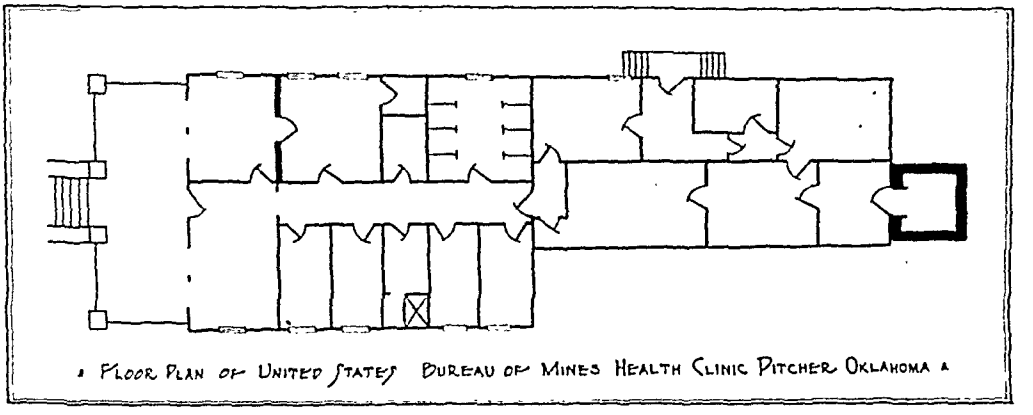
1. That good ventilation be provided to supply air free from dust to all workers.

2. That wet methods be used to lessen the formation of dust and to prevent it entering the air when once formed.

3. Physical examination of all applicants for work in positions where dust exposure exists, with rejection of those having tuberculosis. This rejection is to prevent exposure of healthy workers to the infection, as well as to protect the applicant from any harmful effect from the dust. Periodic examination of all

workers to determine the earliest detectable signs and symptoms of silicosis or tuberculosis should be made.

All men should be informed of the findings and those having tuberculosis removed from exposure to siliceous dust and from contact with others exposed to siliceous dust. Those having simple silicosis should be permitted to make their decisions as to continuing at the work after they are informed of the meaning of the findings.



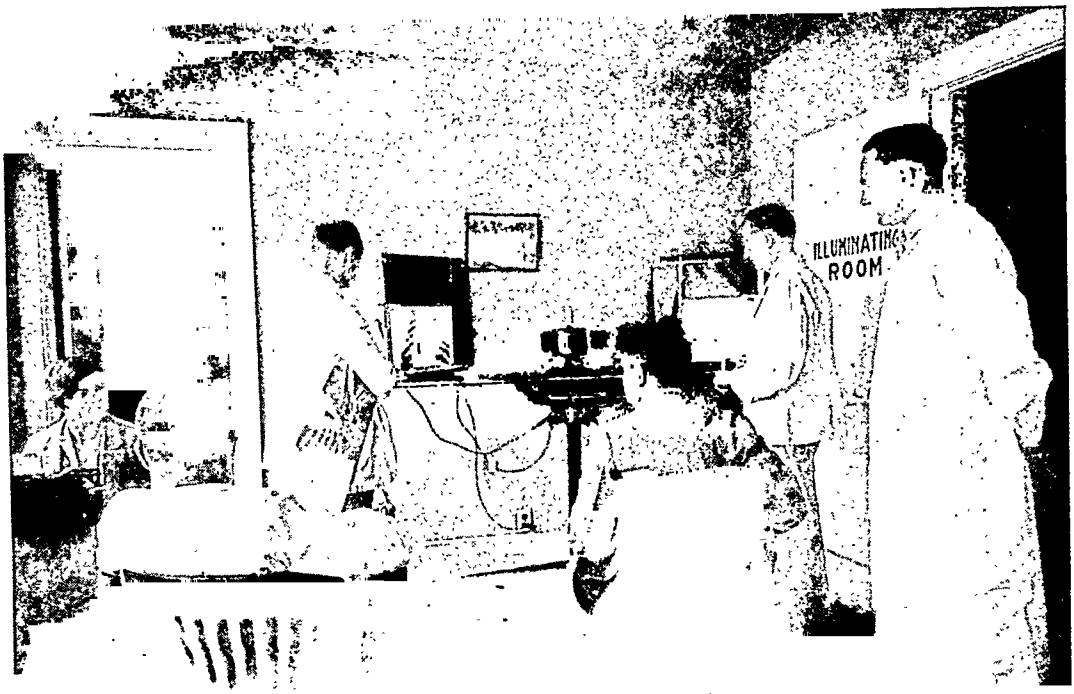
FLOOR PLAN OF UNITED STATES BUREAU OF MINES HEALTH CLINIC PITCHER OKLAHOMA

In the industries in which studies have been made, at least some of the recommendations have been adopted. However, there is no provision for compulsory physical examination of all applicants for work nor for periodic examination of all employees. In 1927, the U. S. Bureau of Mines clinic at Picher, Okla., through coöperation with the Tri-State Zinc and Lead Ore Producers Association and the Metropolitan Life Insurance Company, was enlarged to provide for the examination of all those employed in mining in that district. A special building was constructed, with waiting room, clinical office, four examining rooms, X-ray and developing rooms, X-ray storage vault, dressing rooms, illuminating and conference room, and an office for the physician in charge. In addition, two rooms are provided for the welfare nurses of the district. Figure I shows the floor plan of the clinic.

The personnel of the clinic consists of 4 physicians, an X-ray technician and assistant laboratory technician, chief clerk, 3 stenographers, and janitor.

A standard routine has been developed for examination. On entering the building, a detailed personal and occupational history* is taken. The miner then goes into the dressing room where he undresses and puts on a bathrobe; passes to the X-ray room, where a picture of his chest is made; and then to the photographic room, where

* Copies of the form used may be obtained from U. S. Bureau of Mines clinic, Picher, Okla.



a photograph of his face with his name is made on an identification card (to prevent substitution). He is then given a complete physical examination, special attention being given to the chest, and any defects noted on the history sheet. He next goes to the laboratory for routine blood examinations (Wassermann and Kahn) and, if thought necessary, differential count, stomach analysis, and any additional work desired by the examining physician. The history, containing results of physical examination, laboratory work, and the X-ray pictures, is assembled, read, interpreted, and a diagnosis made. All physical defects are noted and the man given one of the following classifications:

A. Physically sound in so far as can be detected.

B. Average, with such minor defects as slight error in vision or hearing, chronic catarrh, enlarged turbinates and enlarged tonsils, slightly more fibrosis than normal in lungs, large open rings, slight varicose veins, slight varicocele, ingrowing toenails, fat tumors, overweight or underweight, small piles, and such deformities as missing finger, or other deformities that do not interfere with work.

C. Small errors in vision and hearing, very bad teeth, slight rheumatism, silicosis, first degree, moderately bad hemorrhoids or piles (bleeding), moderately bad varicose veins, varicocele, missing fingers, stiff joints (with deformity functioning); certain diseases of the heart, graded C for certain occupations, principally those that will not endanger the man on sudden exertion; also malformations of body that permit of work, as flat feet, beginning goiter, large scars, new growths, psoriasis, eczema, and other diseases that do not seriously interfere with working efficiency or increase the accident hazard, or are not liable to cause sudden death.

D. Seriously defective eyes, hearing, marked rheumatism, deformities, malformations, scars, etc., that seriously interfere with the working capacity; diseases of the heart (liable to cause sudden death), epilepsy, syphilis, gonorrhea, asthenia, very bad varicose veins (with ulcers), cancer in early stages, silicosis, second degree, all contagious diseases, body lice and other vermin, mental defects, and all other diseases considered dangerous to the health of a man employed underground or that will increase the hazard to other men working underground with him.

E. Practically blind or deaf, severe heart lesions (in the last stages), third degree silicosis, severe syphilis, gonorrhea, and all diseases that are liable to terminate in sudden death.

F. Beginning tuberculosis, tuberculosis associated with any of the above diseases, or the closing stage of any of the above diseases.

G. Moderately advanced tuberculosis, moderately advanced tuberculosis complicated with one or more of the diseases previously referred to, or two or more of the diseases previously referred to in advanced stage.

H. Advanced tuberculosis alone or complicated with other diseases.

I. Beginning tuberculosis complicated with silicosis or with some other similar disease that would seriously jeopardize the chances of recovery.

K. Third degree silicosis complicated with advanced tuberculosis.

Men classified A, B, or C are recommended for employment underground, but when those in the C class have certain diseases the card will state " C classification for certain occupations only."

During the fiscal year 1927–1928, the clinic examined 10,427 subjects. The number employed in the mines normally is about 10,000; at present about 7,000 are employed.

E. R. SAYRES, *Chairman*
E. R. HAYHURST
A. J. LANZA

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Establishment of Division of Infant Hygiene in Mexico

A DIVISION of infant hygiene has been established in the Federal Department of Public Health of Mexico. This division will organize infant-hygiene centers, first in Mexico City and later in other parts of the country, for teaching mothers infant care.—*El Universal*, Mexico City, Jan. 22, Feb. 3 & 5, 1929.

Discharge of Filtered Sewage into an Otherwise Unpolluted Stream*

HARRISON P. EDDY, FELLOW A. P. H. A.
Metcalf & Eddy, Engineers, Boston, Mass.

THE sewage of Brockton, Mass., receives treatment at a plant located in the southwestern part of that city near the line between the city and West Bridgewater. The treatment plant consists of sedimentation tanks, trickling filters and sand filter beds. The effluent is discharged into the Cowesett Brook, which in turn is joined by the Ames Stream, coming in from the west, the two forming the Hockomock River.

The water supply of Brockton is derived from a watershed not tributary to the Hockomock River. It follows that the discharge of sewage effluent into Cowesett Brook increases the natural flow of that stream and of the Hockomock River in proportion to the quantity discharged.

It is claimed by lower riparian farmers that as a result of the discharge of effluent into the stream there is in summer such stimulation of aquatic growths along the banks and in the bed as to retard greatly the combined flow; and, further, that the increase in normal discharge, with the obstruction of the channel, results in the maintenance of such high ground water levels in certain low lands bordering the streams as to render them practically worthless for agricultural purposes.

Action to recover damages was brought in the Superior Court of Plymouth County by a group of riparian owners. An auditor was appointed by the court, who heard the evidence and made a view of the Brockton sewage works, streams and lands involved. The report of this auditor was presented recently to the court, and a review of the case is of considerable interest from the standpoint of the sanitary engineer.

Below the junction of the Ames Stream and the Cowesett Brook, the Hockomock River flows in a general southerly direction for several miles, then turns east to form, with Nippenicket Brook, the Town

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

River, which flows east, then south, until it joins the Taunton River, which in turn empties into Narragansett Bay. The upper portion of the watershed above West Bridgewater is gently rolling farm land upon which are scattered several small villages, none of which is supplied with a sewerage system. Along the lower course of the Hockomock and in the vicinity of the Nippenicket Pond, from which the Nippenicket Brook flows, there is an extensive area of low land known as Great Cedar Swamp. The watershed areas of the several streams above certain significant points have been determined from the U. S. Geological Survey maps as follows:

Cowesett Brook at confluence with Ames Stream, 7.9 square miles
Ames Stream at confluence with Cowesett Brook, 9.6 square miles
Hockomock River at West Center Street, 20.1 square miles
Town River at Ames Dam, 52.8 square miles

HISTORY OF THE USES OF THE HOCKOMOCK RIVER

For many years the Ames Stream and Cowesett Brook have been used as sources of water power, and dams and mills have been constructed upon them. The milldams on the Cowesett Brook have ceased to function as such, but the small ponds formed thereby are used for ice harvesting. The Ames Stream is still used to some extent for water power. In the Town of Easton, the Ames Agricultural Implement Company maintains a small shovel mill operated by water power, which has been in existence for many years. The water of this stream is again used for power at three different points. Below the Ames Company two other water powers are utilized during four or five months of the year. No milldam or pond occurs below the junction of the Ames Stream and the Cowesett Brook until the Village of West Bridgewater is reached, about 10 miles downstream, where there is an old dam called the Ames Dam, located across the Town River.

The stream and its tributaries have been used for water power for many years and the flow controlled according to such use, this being by riparian owners and within their rights. The utilization of the streams for power is of significance in connection with the claims and counterclaims during the legal proceedings described later.

Brockton Sewage Treatment Plant—In 1893, the city of Brockton began the construction of a sewerage system and in 1894 a sewage treatment plant consisting of intermittent sand filters was built. These were located in the extreme southwest corner of the city and the effluent discharged into Cowesett Brook. The present plant consists in part of the original filters, with sedimentation tanks and trickling filters constructed during the past 16 years.

The sewage flows at Brockton have in general steadily increased from about ⅓ m.g.d. in 1896 to over 3½ m.g.d. in 1927. This fact is of particular significance as regards the changes in the character of Cowesett Brook and Hockomock River by the discharge of sewage effluents.

Effect of Discharge of Brockton Sewage Effluent—The first effect of the discharge of the effluent is to increase the normal flow of the streams into which it enters. In winter, this is materially less in proportion than in summer, due to the greater natural run-off. The effect is proportionately less in a wet than in a dry year. The proportions of effluent in the Cowesett Brook below the treatment plant for the months of July to October, inclusive, 1923, computed on the basis of data presented during the hearings, are given in Table I.

TABLE I

PER CENT INCREASE IN NORMAL STREAM FLOW DUE TO DISCHARGE OF BROCKTON SEWAGE EFFLUENT

1923 Month	Sewage Flow c.f.s.	Normal Stream Flow Cowesett Sta. 4 c.f.s.	Normal Stream Flow Hockomock Sta. 5 c.f.s.	Per Cent Increase due to Sewage Effluent at Sta. 4	Per Cent Increase due to Sewage Effluent at Sta. 5
July	3.92	2.22	9.78	177	40
August	3.18	1.56	7.89	204	42
Sept.	3.11	0.75	5.43	415	57
Oct.	3.02	2.29	9.98	132	30

It will be seen that in the summer of 1923 a large proportion of the average monthly flows of Cowesett Brook and Hockomock River consisted of effluent from the Brockton plant.

One of the most serious effects of effluent, as claimed by the plaintiffs, is the stimulation of aquatic growths and the resultant clogging of the channels by the growths and by banks of silt and sand, the formation of which is fostered by these growths. Plant growths are stimulated by nitrogen in the form of nitrates and by carbon dioxide, both of which are present in considerable quantity in sewage effluents. The very heavy growth of vegetation in the Hockomock River below the plant at Brockton aggravates materially the effect of the augmented stream flows.

The combination, therefore, of channel obstruction with abnormal flow during the summer months results in the maintenance of high water levels in the stream and high ground water levels in the low lands along the stream so that it is impossible to secure proper drainage of these lands. Much of the land adjacent to the stream is subject to flooding under normal conditions in winter and spring, but in summer in earlier years has been cultivated and crops grown thereon.

Another effect of the discharge of sewage effluent has been to change the physical appearance of the stream as regards color and turbidity. In the early days of operation of the intermittent sand filters, the effluent was practically clear and colorless and had little effect upon the stream into which it was discharged. As these filters became inadequate to care for the entire sewage flow, trickling filters were built, part of whose effluent after sedimentation was discharged directly into the stream, and part upon sand beds. The turbid character of that part of the effluent not passed through the sand beds brought about an increase in turbidity and color in the stream receiving it. Above the entrance of the sewage effluent, the stream is ordinarily clear, with a slight natural brown color, and odorless. Below, the stream became gray or gray-brown in color, turbid, and at times slightly odorous. The character of the stream bottom changed from clean sand or gravel to black humus-like material, and at times masses of worms similar to those found in trickling filter media were noted.

Analyses have shown a marked increase in organic constituents and in bacterial content in the stream waters below the treatment plant. The organic matter has been sufficient in summer to bring about a marked reduction in the dissolved oxygen content of the stream. Such reduction, however, has not been sufficient to bring about putrefactive conditions of the stream water. Offensive conditions, however, have been caused, due to the stimulation of large growths of duckweed which at times have collected in masses, died and decayed, with the production of offensive odors.

Hearings before Auditor—During the hearings, which consumed about 20 days, much evidence, both technical and lay, was presented by plaintiffs and defendants. Some of this is summarized in the following paragraphs:

The sewerage system and method of sewage disposal adopted by Brockton were authorized by an Act of the Massachusetts Legislature in 1890.* Section 2 of this Act referring to the Board of Commissioners of sewerage construction authorized by the Act reads in part: "said Board of Commissioners shall have exclusive authority to construct, maintain and operate the system of sewerage and of sewage disposal adopted by the City Council. . . ."

On May 28, 1890, the City Council of Brockton adopted a system of sewage disposal in an order reading as follows: "Ordered, that a system of sewerage be, and the same is hereby adopted for the whole territory of the City of Brockton, with mains, pumping stations and

* Chapter 248 of the Acts and Resolves of 1890 of the Massachusetts General Court.

irrigation lands, as may be necessary to successfully operate a system of sewage disposal by 'downward filtration,' which system of sewage disposal is also hereby adopted."

This order, and particularly the description of the system of sewage disposal as "downward filtration," assumed some importance in the course of the case. It was claimed by the plaintiffs that the trickling filters did not comply with the original plan and scheme adopted and authorized by the city council. No record of the adoption of any other method of disposal was produced by the city. The plaintiffs' contention that there was a departure from the original plan and scheme was based upon the interpretation that in 1890 the term "downward filtration" referred to intermittent sand filtration, that trickling filters had not been devised at that time and being a subsequent invention could not have been the method of sewage disposal then adopted. The defense claimed that "downward filtration" was a general term applicable to any kind of filtration, trickling filters or intermittent sand filters. The plaintiffs in turn pointed out that in the records of the original order the term "downward filtration" was set off by quotation marks, showing that a specific kind of filtration was meant and that the intermittent sand filters installed were in compliance with the meaning of the order. The contention of the plaintiffs in this matter was upheld by the auditor in his report.

It was brought out that in time the original filter beds became overtaxed, resulting in a deterioration in the quality of the effluent. Due to the inadequacy of available areas for extension of the sand beds, it became necessary to adopt a different system of treatment. After studies and experiments trickling filters with preliminary and secondary sedimentation tanks were adopted by the sewage commission but without formal adoption by the city council.

From the correspondence passing between the city authorities and the State Health Department, it appeared evident that treatment of the final effluent from the trickling filters upon the old sand beds was contemplated. As a matter of fact, certain of the sand beds were set aside for this purpose but, as was brought out in the testimony, only a portion of the trickling filter effluent was thus treated, although steps were under way to make available more sand bed area so that the entire trickling filter effluent could be treated thereon. The auditor found that if the trickling filter effluent were passed through the sand beds, the city would be treating the sewage in accordance with the original method adopted by the city council in 1890 but that it failed to treat according to the method adopted when trickling filter effluent was discharged directly into the stream.

Evidence was given to the effect that stimulation of aquatic growths would occur whether trickling filter effluent or sand bed effluent were discharged, and that good sand bed effluent might result in even greater stimulation of growths due to its more highly nitrified character.

The defense claimed that the regulation of the Ames Stream for power purposes was an important factor in the maintenance of high water levels in the Hockomock River but presented as evidence a maximum observed effect of only about 6 inches at the property of the owner of the largest areas involved. As power regulation had existed for many years, the contention that it was a material factor apparently received little attention on the part of the auditor.

It was difficult to estimate the rise in water levels as a result of the obstruction by excessive aquatic growths. This difficulty was due in part to the fact that no hydraulic study of the stream had been made prior to the time it became affected by the vegetation. Furthermore, the course of the stream is meandering and its cross-section varies materially from point to point, making hydraulic measurements of doubtful significance. Based on judgment and a few actual measurements, it was estimated by the engineers for the plaintiff that the normal water level in the stream during the summer months had been increased from 1½ ft. to 2 ft. by the excessive vegetation in the stream. This estimate was accepted by the auditor, who found that the land involved had been rendered worthless as a result of the increase in water levels resulting directly and indirectly from the discharge of the effluent from the Brockton sewage treatment works. The several plaintiffs were awarded damages amounting to the fair market value of their lands as of 1914 together with interest from the date of the writ.

CONCLUSION

This case is illuminating as to the results which may follow the discharge of effluents from sewage treatment plants into streams where the natural flow available for dilution compared with the volume of effluent is small. Two lessons are taught: (1) Well purified effluents require substantial dilution. (2) Extensive easements may be necessary where adequate dilution is not available.

Steps in Planning a Health Education and Publicity Program*

The Facts—How to Decide What Is to Be Told

C.-E. A. WINSLOW, DR. P. H., FELLOW A. P. H. A.

Professor of Public Health, Yale School of Medicine, New Haven, Conn.

IT IS my special function to discuss the factual material to be used in this campaign, to suggest criterions by which we may select the particular things which we wish to tell the world. This is, after all, a somewhat important consideration if publicity is a means and not an end in itself. The points we select should be true, important, comprehensible, acceptable, and usable.

First, our facts should be facts. All truth is relative, but we can at least strive to escape the cruder errors of the past. We can avoid giving the impression that litter and paper in the street and in the back yards are likely to produce disease; that dust is a fertile source of infection; that dental caries bears an inverse relation to the use of the tooth brush twice a day. On the other hand, we should not be too eager to introduce into our programs of popular education the newest suggestions of science before they have become established and accepted. We should be careful about advocating the indiscriminate use of iodized water or salt, or of scarlet fever serum as preventives. We should be cautious as to our statements regarding the relation between neglected tonsils and infections of the heart. These, and many more things which are interesting us at present, may prove to be true; but only after thorough thrashing out of all opposing scientific points of view should we shout the conclusions of science into the public ear. As Polonius tells us—" Be not the first by whom the new is tried, nor yet the last to cast the old aside."

In the second place our facts should be important. The statement of even an unquestioned truth with over-emphasis may often prove misleading if we do not bear in mind the relative proportion of different truths and their probable effect upon the public mind. It

* Papers from a symposium of the Public Health Education Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17 and 18, 1928. Papers by Mary Swain Routzahn, Howard Whipple Green, and Marjorie Delavan appeared in May, 1929, JOURNAL.

is true that clean milk is better than dirty milk and for children it is probably more healthful. It is probably true that tuberculin testing of cattle is a useful mode of protecting these animals against one of their commonest and most serious diseases. It is not, however, true that clean milk from tuberculin tested herds is necessarily or probably safe milk for human consumption. There is only one safe milk—that which has been made safe by heating. This is the important fact for the public to know and, if emphasis on the other and lesser facts obscures this one, we are doing harm and not good.

In our program of public health education as a whole we may properly ask for something even more than accuracy of emphasis in regard to each particular problem. We may also demand that each problem emphasized be set into a general scheme which will make for a comprehension on the part of the public of the broad and fundamental principles which underlie the promotion of health and the prevention of disease. There are, I believe, some dozen such principles which we should like every member of the community to grasp, and we may properly consider how each element in our educational plan contributes toward building up these basic attitudes.

We must, for example, make sure that our educational program as a whole tends to further an understanding of the established elements in personal hygiene. We want our public to understand the importance of diet as a basis of sound health, an importance which we are realizing more and more fully with every passing year. There are few things which would accomplish more for health promotion than an increase in the consumption of milk, fruits and green vegetables; and the change in the dietary habits of a whole population, accomplished at Fargo as a result of well planned health education in schools, is one of the most significant accomplishments of recent years. We want our public to understand the rôle of cool, moving air as a factor in the hygiene of the skin and as an important element in promoting resistance against respiratory infections. We must emphasize the value of exercise and the hygienic significance of sleep and rest. We must keep in view the novel, and as yet only half understood, principles of mental hygiene. In this field we are not only missing invaluable opportunities, but we are often perhaps doing positive harm. I once saw a poster representing a foreman administering to the worker with a large spoon "His daily dose of lead." Such a poster tends to create mental disease more than to control industrial poisoning.

Our main objectives should also look toward a comprehension of the ways in which communicable diseases are spread and in which they may be controlled by the protection of water and food supplies, the

elimination of insect carriers of disease by isolation and quarantine, and by such habits of personal cleanliness as tend to guard the gateway of the mouth. Above all, we must work for a real comprehension on the part of the public of the principles of vaccine and serum therapy.

Still another set of principles which should be basic are those which deal with the relation between the physician and the patient. We should do everything that we can to build up the idea that the physician is a trainer and not a repair man, and to show how, from the prenatal period through infancy and school life, in industry and in the decades of degenerative disease, the principle of health examination is essential to a maximum of health and efficiency.

Everything that we include in our health education program should consciously lead toward the building up of a knowledge of principles of healthy living, and this program should be so organized as to cover them all with reasonable completeness in any period of a year.

In the third place, the facts we teach should be comprehensible to the man in the street, and not merely to the statistician, physician, or sanitarian. Statistics addressed to the general public should be simple and obvious in their bearing. Lists of the number of cases of communicable disease occurring in a city or state during a given week have a charm which is beyond my personal comprehension, but which is clearly indicated by the eagerness with which newspapers give space to bulletins of this sort. From the public health standpoint, they are almost meaningless, but they apparently appeal to the average reader like the box score of a baseball game. They give the impression that something is happening. They form current news. On the other hand, proportions and averages mean little or nothing to the average reader. When one reads, as in a recent city bulletin, " . . . about 3 out of every 5 children less than 6 years old can catch diphtheria, and about 2 out of every 5 children between 6 and 10 years of age can catch this disease," the average reader with a 13-year mentality is absolutely " sunk." Specific individual cases with the human appeal carry far more effectively than most statistics, and many visiting nurse associations are obtaining splendid health publicity with data of this kind. In general, our material should be simple and concrete, and our programs so planned that one lesson at a time may be hammered in, before the public mind is confused with some different and perhaps conflicting issue.

The fourth of our criterions is, that the facts we select for our educational program should be emotionally acceptable. If we are to accomplish results, it is essential not only to catch the interest of the hearer but to arouse in him a desire to attain the aim set forth.

There must be motivation as well as intellectual conviction. In considering this aspect of the problem we should lean more heavily than we have done upon the psychologists and professional educators.

Finally, as our last criterion, it is perhaps scarcely necessary to emphasize that the facts which we teach should be usable. In dietary instructions it is not of particular value to urge the drinking of milk in a southern industrial community if no milk can be obtained. It is futile to advertise toxin-antitoxin treatment of children unless there are clinics where the treatment can be administered. It is useless to urge an adult to go to his physician for a health examination, unless there is some reasonable probability that when he goes he will get one.

SUMMARY

The object of our whole program is, I take it, to change the conduct of individual men, women and children. We want them to manage their bodies well; to help us check communicable disease; to use preventive medical service; and to support the community program of health promotion. In the factory, it is possible to analyze every industrial operation into the simple exposure form of a raw material to a tool or a process with the production of a finished product. Our raw material is ignorant human nature; our finished product is the citizen trained in healthy living. Our tools are our bulletins, newspaper articles, lectures, radio talks, and cinema showings. The facts that they teach must be true and important or the educational process will not be worth the cost. They must be comprehensible, acceptable, and usable, or there will be no effective educational process at all.

We are interpreters between the vast resources of health science on the one hand and the individual in the home and the factory on the other. We must keep both things in view. We must believe in both. We must have faith in the message we deliver. As Richard Cabot once said, I think, of social service, we must feel that we have something " too hot to hold." We must also believe in the educability of the common man, or our efforts will be spiritless and futile. It is these two faiths after all—faith in the cause, and faith in human nature—which make the health educator. Whatever our technic, whatever our rigidness of self criticism, we must add at the end that quality of enthusiasm—a word which in its derivative sense means an inward god. The work of translating the lessons of science into human conduct is indeed a godlike one. If we fully realize its significance, we shall not fail.

The Approach—How to Decide on the Motives for Conduct to Which an Appeal Will be Made

FRANKLIN FEARING, PH. D.

Department of Psychology, Northwestern University, Evanston, Ill.

BROADLY speaking, there are but two fundamental questions which may be asked regarding human behavior: *How* do individuals act as they do—what are the mechanisms and processes involved in behavior? and *why* do people act as they do? It is with the latter question that we are primarily concerned in the present discussion. Attempts to answer this question have been made since man first speculated regarding the origin and causes of his own acts. A completely satisfactory answer would imply the ability to predict individual action on the one hand, and the ability to control or modify it on the other. We must confess that such an answer is not forthcoming in the present state of our knowledge; the claims of the pseudo- or itinerant-psychologist, the phrenologist, and the quackish fraternity in general to the contrary notwithstanding. While the advance which modern psychology has made in this field does not enable us to manipulate individual action with certainty, it offers data which are suggestive to those who are concerned with problems of direction and control of public opinion, and the modification of individual action.

What is the nature of those inner or outer factors which determine and control our behavior in given situations? Why, for example, do I turn my head toward the source of a sudden loud sound, stop my automobile when the traffic light flashes red, stand up when the national anthem is played, vote for a particular presidential candidate, or read a paper before a scientific association? The blanket term " motives " may be applied to all those factors or mechanisms in the organism which determine my response in these or other situations. A motivated response, then, is one which is determined primarily by conditions or factors within the organism. Knowledge of the nature of these factors is of the greatest significance to all those interested in the modes of effective appeal with a view to modifying human action.

There have been those who would say that these inner factors or motives are primarily rational and logical in nature. It is assumed that man is possessed of nicely tied-up packages of knowledge, called ideas, as a result of experience in the world, and after a preliminary

period during which these ideas are compared and arranged, reasoned and logically determined actions result. Furthermore, it is assumed that some of these ideas carry with them a kind of inherent rightness or soundness—as though they were certified checks—which will be instantly recognized by all reasonable and right thinking persons, and hence will lead to sound judgments and reasonable behavior. I am, for example, presented with a leaflet on which is emblazoned the statement that "Heart disease, after age 40, heads the list of causes of death in the United States," with the accompanying suggestion that death from this disease can be reduced by early diagnosis and treatment. As a bit of presumably authoritative information, this statement is interesting, but it carries no guarantee that it will stimulate rational thought which will lead to desirable action in the form of periodic physical examinations. At best it will arouse a mildly disturbing fear reaction.

The conception of human action as motivated by conscious rational processes presents an artificial and unreal picture of behavior. It is true that we rationalize our behavior after the acts have taken place. It is true also that in certain restricted fields, for example, science, rational processes probably occur before action. But it is one of the most certain conclusions of modern scientific psychology that in the vast majority of our actions there is little in the way of preparation that may be included under such terms as reasoning, judging or thinking. A publicity program based exclusively on the assumption of rational motivation in human action cannot be expected in the long run to yield satisfactory results.

A second assumption regarding the controlling factors in action is that the organism responds in a more or less mechanical way to external stimuli. From the point of view of this conception the "right" stimuli will inevitably release the "right" responses. For example, correct information or positive instruction regarding prevention of disease is expected to lead to positive and desirable action. This will not occur unless the information or instruction is arranged to appeal to motivating factors within the individuals to whom the appeal is directed.

It is with the nature of these motivating factors that we are concerned in organizing and presenting publicity material which is designed to modify human action. My reaction to the names Herbert Hoover or Alfred E. Smith or Norman Thomas is not explained by those words as merely auditory or visual stimuli, or even by the purely intellectual considerations of what I am told is their position on the tariff question. My reaction, in so far as it has drive and intensity,

is determined by the appeal which those names, as symbols, make to certain fundamental, non-rational reaction patterns or tendencies to action. These reaction patterns or mental sets, many of which were acquired in childhood, furnish a background and are the source of the drive for most of the activities of the individual. Some of these may be inherited, but most of them are acquired by a process of social conditioning. They are called attitudes and may be defined as the more or less persistent tendencies by reason of which the individual is rendered particularly susceptible to certain kinds of situations.

I may have, for example, a strong attitude regarding animal pets —dogs in particular—which will determine in large measure whether I shall enthusiastically support or resist an attempt to enforce a measure to muzzle dogs in an antirabies campaign. It may be that my somewhat undiscriminating affection for dogs will cause me to view the entire campaign in the light of an unwarranted persecution of these animals. This may lead to an active resistance to all attempts to muzzle my own dog and an attempt to organize public sentiment against the measure itself. On the other hand, a deep-seated fear of dogs may cause me to see a mad dog in every panting animal met in the street. These attitudes may have existed over a long period of time and possess an intense emotional coloring, or they may have been established by a single recent experience. For example, the sight of a dog chasing a child, or an instance of a neighbor's child being bitten, or the report of my own child that he has been attacked by a dog, may serve to set up an attitude which will determine my response to any type of stimulus which relates to dogs. In these instances we have action determined by processes in which reason and logic play little part.

Attitudes of a more general type are illustrated by one's reaction to such topics as immigration, prohibition, socialism, Bolshevism, etc. In these cases the attitudes are released or " touched off " by a wide range of stimulating situations. Our attitude toward Bolshevism, for example, may determine our behavior toward Russian art, the Russian ballet, Lenin, whiskers and Tolstoi.

A striking characteristic of attitudes of the latter type is the facility with which they become attached to symbols. These symbols, or stereotypes, as they are called, are illustrated by our conception of a bewhiskered Bolshevist throwing a bomb, the absent minded college professor, the excessively collegiate college student, the long haired poet, the excitable Frenchman, the phlegmatic Britisher, and so on. These stereotypes frequently symbolize our attitudes toward certain individuals, groups, or races, or they may represent our atti-

tude toward an idea or principle. They are of the greatest significance to those who are concerned with the control or modification of individual action for the reason that by means of pictures or in other ways, it is possible to appeal to the attitudes of the individual through his stereotypes.

This appeal is possible because, to a large extent, the stereotypes which the individual holds determine the nature of the impressions which he gets from the world about him. My stereotype of the Englishman expresses my antagonism and hatred, or my affection and respect; in either case it acts as a selective factor so far as my impressions of Englishmen are concerned. These stereotypes may be formed as a result of a slow accretion of impressions over a long period of time, or they may be formed as a result of systematic propaganda. When they represent the collective attitudes of a group, they may compel the object of the stereotype to conform to the picture. For example, the American stereotype of the youthful aviation hero compelled its object, Lindbergh, to conform or " fit into " the picture. The creation of these stereotypes is one of the great games of the publicity agent, as a result of whose activity we may have the " strong silent man in the White House," the " people's friend," the " great humanitarian," and the " happy warrior."

We may briefly summarize the characteristics of attitudes and point out their significance to those who are trying to modify the conduct of men, women and children. Attitudes as factors in human action may be characterized as follows:

1. *They tend always to express themselves in action.* They are potential actions. In fact, they may be said to exist only in so far as they do obtain overt expression. The individual from one point of view may be regarded as constantly seeking situations in which these attitudes may find satisfying expression.

2. *Attitudes tend to have a strong emotional coloring.* They have their roots in our likes and dislikes, our fears, hates, and joys.

3. *Attitudes do not involve rational processes as an antecedent to action.* Deliberative action involves a balancing of the issues and tends to inhibit or at least retard action. Actions which involve major attitudes tend to be immediate and intense.

4. *Attitudes may be conscious or unconscious.* That is to say, I may recognize and identify my attitude or I may fail or refuse to recognize that my actions are motivated by a particular attitude.

5. *Attitudes are associated with and easily released by symbols, signs, slogans, phrases, catch-words and pictures.* The individual tends to build up a stereotype or mental picture in which the attitude is personalized and characterized in graphic form. Newspaper cartoons make large use of this mechanism in appealing to group attitudes. Slogans almost always appeal to attitudes. Whoever stops to analyze intellectually a slogan? It is what the slogan implies or suggests that makes it effective.

6. *Where fundamental attitudes are involved, the response is out of proportion to the intensity of the stimulus.* The wild enthusiasm incited by the appearance of a brown derby can scarcely be accounted for in terms of the brown derby as a visual stimulus.

7. *Attitudes may be developed as a result of a single experience, or they may be established by systematic and persistent propaganda.* An example of the first is the establishment of an intensely negative attitude toward a given race as a result of a single unpleasant experience with a representative of that race. In the second case my attitude towards public health may be established as a result of the continuous presentation of materials arranged in dramatic and dynamic settings, suggesting success, prestige, happiness and efficiency.

The significance of attitudes to those interested in a program of health education is obvious. The objective of such a program is the modification of conduct of men, women and children with regard to what might be termed " health behavior." Such a change in conduct cannot be effected except through a change in attitudes.

We may apply the term propaganda to the technics involved in bringing about such a change. Propaganda has been defined as " the manipulation of attitudes by means of significant symbols," and has for its object the arousal of action in specific situations. The most effective modes of propaganda appeal are those which refer to established stereotypes. These take graphic form in pictures and symbols or the written form in slogans. There must always be a certainty that there is some relevancy, i.e., some assumed causal connection between the picture, symbol or slogan and the attitude or stereotype to which the appeal is made. The public health behavior which it is your purpose to establish must be demonstrated in dramatic form, and presented in settings which connect it with the stereotypes and symbols, for example, of success, power and prestige. From the psychological point of view, the function of propaganda and publicity organizations may be generalized as follows: they are concerned with the development of tendencies to action, i.e., attitudes, by the manipulation of significant stereotypes, and the arrangement of satisfying situations which permit the completion of actions thus initiated.

Propaganda campaigns may be divided into three classes:

1. *The campaign may be directed toward already existing attitudes.* Known attitudes of the group regarding childhood, old age, and personal hygiene may be made the object of appeal. The technic in this case consists in associating already established attitudes with new situations. One of the characteristics of human nature is the tendency to infer a causal connection between events or situations experienced together. If Mrs. Astor-Vanderbilt permits her picture to be used in the advertising of a certain cosmetic, the attributes of success and prestige which are attached to Mrs. Astor-Vanderbilt become attached in our minds to the cosmetic in question.

2. *The objective may be the establishment of new attitudes.* Individuals who are neutral or indifferent are usually individuals who have no attitude with regard to the appeals which are made. A basis for the attitudes to be established should be laid in the form of an educational or informational campaign. But such information and education is futile unless it is eventually made the basis for action, that is, unless attitudes are established with regard to it. Not merely authoritative information, sound health instruction, accurate vital statistics, but dynamic, dramatic and systematic propaganda is necessary.

3. *Opposing attitudes must be overcome.* This is the justly famous "sales resistance." In general the technic in this case consists in avoiding rather than antagonizing the resisting attitudes of the groups appealed to.

All propaganda agencies make some assumptions regarding the psychological make-up of the constituency toward whom their appeals are directed. A fundamental problem has to do with the nature and kind of fundamental attitudes which may be assumed to be present in the beginning. Just what are our fundamental attitudes? Here it is necessary to proceed with the greatest caution. Assumptions in this connection based upon armchair speculation are very easy. It is necessary to be realistic about the matter rather than indulge in sentimental assumptions regarding the essential goodness of human nature. Is there a realistic basis for the assumption of fundamental attitudes regarding kindness to animals, affection for children, love of home, desire to be healthy, desire for and interest in good citizenship? As a matter of fact we do not have generalized attitudes regarding these matters, but specific attitudes regarding specific situations, events or people. A detailed analysis of the fundamental attitudes to which public health propaganda should be directed must be based upon careful research to determine the nature of the attitudes regarding public health held by the majority of individuals. Investigation of the results of specific types of response to public health propaganda, together with the study of group attitudes already existing, is absolutely essential to the development of an intelligent and realistic program of public health education. Until research of this type is undertaken, propaganda will be upon a trial and error basis; some of it will succeed, much of it will fail.

There is one fundamental attitude which is sufficiently common to warrant mention. It may be termed the prestige motif in the individual. It is variously called the desire for success, power, domination, or place. It is the attitude toward which much of the most skillful advertising of our day is directed. Why do we wish to avoid halitosis, buy tooth brushes, Life Buoy soap or expensive motor cars? There seems to be a fundamental drive to appear well in the eyes of our fellows, to make a good impression, to be appreciated.

The same appeal and the same attitude which results in the sale of vast quantities of Listerine might be successful in obtaining periodic health examinations. The fundamental features of the American stereotype are embodied in the terms success, domination, efficiency, power, size. The appeal of the beggar on the street and the wistful waif of the Community Chest campaign literature is effective not because they arouse alleged sentiments of generosity or pity for the helpless, but because these figures represent a distressful negation of success, efficiency and power. In a sense, these symbols are effective because they appeal to our desire to escape from that which is unpleasant. If public health programs can be linked with efficiency and success stereotypes, experience has demonstrated that a measure of success is certain.

Examination of public health propaganda literature reveals the fact that the most frequent appeal is to fear attitudes. This may be occasionally warranted, but in the long run it is dangerous, inimical to mental health, and may lay the foundation for the development of specific mental disorders. It may be ineffective also, since we are much more concerned about the state of our prestige than we are fearful regarding the state of our hearts or lungs.

The methods herein described do not depend for their efficacy upon the ultimate soundness or truth of the facts or principles in the interest of which the campaign is conducted. The guaranty that those facts and principles of public health possess a degree of scientific certainty is the only justification for the use of the methods described. The absence of that guaranty reduces public health education to the level of a campaign for the sale of cigarettes.

As a psychologist rather than a public propagandist, I should seriously consider the proposal to conduct a campaign to immunize the public against all campaigns. One of the modes of establishing such immunity would be to establish a vigorous critical attitude in all people regarding the essential validity and the actual realities represented by the campaign hokum, stereotypes, mythological figures and slogans established as a result of high powered publicity. Is the man in the White House really strong and silent? Does the Brown Derby conceal a real democrat? Is there valid statistical proof that a toothbrush drill in schools really reduces the frequency of teeth defects in adults? When the public discovers that there is no fundamental reality to the illusions and stereotypes created by propaganda, an anti-campaign attitude will be set up which will mean the ultimate elimination of all educational propaganda. Therein lies a warning—a warning which, perhaps, it is not the function of the psychologist to voice.

EDITORIAL SECTION

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THE WORM TURNS

THE old slogan, " It Pays to Advertise," seems to need some slight revision. For two or three years past, we have been afflicted by cigarette advertisements which were preposterous on the face of them, many accompanied by photographs of movie actors and actresses, baseball and football players, heroes, and—most disgusting of all—a well known Army officer. One brand or the other, as the case may be, wins elections, prize fights, makes statesmen, educators, musicians, or anything else which may seem desirable at the moment. The sad part is that these claims, ridiculous as they are, seem to sell the goods, and at least one company boasts constantly of the increase in cigarette consumption, presumably due to its particular alleged method of treating the tobacco.

The world has at last turned. Naturally the different companies have resented some of the advertisements. There have been movements against the sale of certain brands in restaurants and other public places where sweets are also sold. The candy and sugar manufacturers generally have naturally taken the opposite side, and are pushing their wares, up to the present in an ethical and truthful manner. A number of organizations of national scope, as well as clergymen, physical educators, and welfare agencies, have taken up the fight against the wholesale advertising of cigarettes.

The radio furnishes a means of reaching easily many people; so it is only natural that its services have been enlisted. The most recent movement is a petition to the Federal Radio Commission for the revocation of the licenses of 38 radio stations, located from the extreme North to the extreme South, and from the Atlantic to the Pacific. The petition is based on the grounds that the programs of

a particular tobacco company which are being broadcast are "contrary to public interests, convenience or necessity"; that the object of the advertisement is to transform 20 million growing boys and girls into cigarette addicts; that cigarettes are advised as a substitute for wholesome foods; and harmful diet fads are being encouraged at the expense of health.

Just as the brewers and distillers went to extremes which led to their downfall, so it seems that some cigarette manufacturers are exceeding the bounds of reason and common sense. Whatever differences of opinion there may be as to the use of tobacco by adults, it is universally conceded that its use by adolescents is harmful. The excessive use of cigarettes, combined with the lessening of the appetite and the avoidance of foods which furnish heat and energy, has probably played its part in the increase of tuberculosis noted among young women during the last few years, attention to which has been noted by certain boards of health and statisticians.

PUBLICITY FOR PUBLIC HEALTH

LOUIS E. Schmidt, M.D., Professor of Urology at Northwestern University, Senior Urologist at St. Luke's Hospital, Chicago, Fellow of the American College of Surgeons, Vice-President of the American Public Health Association, just elected member of the Board of Directors of the American Social Hygiene Association, member of leading medical societies in his specialty in this country and abroad, has been expelled from membership by the Chicago Medical Society for "unethical" conduct. The case has attracted national attention in the daily press and in lay and professional magazines, the spur of popular interest being the impression that the action of the medical society was a move against efforts to reduce the cost of medical care.

This is not the place to enter into the merits of the case in its bearing upon an individual. Those who have followed Dr. Schmidt's endeavors through the Illinois Social Hygiene League and otherwise in the campaign to combat venereal disease, and those who have been acquainted with him through professional and personal contacts, have complete confidence that the motives which have animated him have been those of public service and not personal glory or financial gain.

An issue of larger moment transcends the personal aspects. The basis of Dr. Schmidt's removal, the Council of the Chicago Medical Society states, had nothing to do with the cost of medical care, but "rested solely upon a violation of the principles of medical ethics" (Official Bulletin of the Society, April 20, 1929, page 25). The state-

ment then quotes "the principles of medical ethics applicable to the case in question" which refer to publicity, advertising and the solicitation of patients. The Public Health Institute of Chicago, a non-profit organization, has for 10 years been conducting a large and successful pay clinic for the treatment of venereal disease under the management of a board of trustees, composed of leading business men in Chicago, and has employed paid advertising in Chicago papers. Dr. Schmidt has had no direct connection with the Institute, but is President of the Illinois Social Hygiene League, which about a year ago entered into a contract with the Institute, whereby the latter organization paid an agreed sum out of its current surplus to meet the deficit of the League. The Institute also assumed administrative supervision of the charitable clinic conducted by the League.

The advertisements of the Public Health Institute, at least during the last few years, have been directed toward informing the public of the dangers of syphilis and gonorrhea and the need for continued treatment under competent medical direction. The names of no individual physicians have been mentioned in the advertisements. The Institute's name and address has, of course, been given. The members of the lay board of trustees have printed their names in the advertisement as sponsors.

All those interested in public health, whether physicians or not, will unite in condemning the use of advertising or any other form of publicity which is for the profit or aggrandizement of individuals or organizations. The section of the code of ethics of the American Medical Association referring to advertising (Article I, Sec. 4) was extended a few years ago, mentioning "institutions and organizations" as well as individual physicians. The phrasing in this respect is somewhat indefinite. Certainly the public interest demands that there shall be an effective distribution of information concerning diseases dangerous to health, the importance of securing care and that there shall be made known to the public the resources in each locality, in private practice or in organizations, through which adequate attention can be secured.

Publicity of resources for care in venereal disease is especially important, but the principle is fundamentally the same in respect to informing the people about other conditions—tuberculosis, cancer, and diseases of infancy or maternity being examples. Whether publicity is in the form of paid advertising, unpaid news notices in the press, pamphlets, posters or other publications of an organization, seems of little significance, provided the intent is for public service and not for private gain, and that the subject-matter and wording are scientifically

correct, educational and discreet in avoidance of solicitation of patients or exploitation of individuals. The interests of the public health and the increasing demands of the general public for information render it of the highest importance that the code of medical ethics be not interpreted as to hamper properly worded and rightfully motivated publicity.

AN ANNUAL REPORT AND ROMANCE

ANNUAL reports are usually synonymous with boredom. If their subject matter is intrinsically interesting, its treatment frequently dampens the reader's enthusiasm. The appearance of a report which compares more than favorably with an attractive romantic novel therefore deserves special comment. Of all the topics ordinarily uninteresting to the reader, a water supply report is often the dullest, excepting to the enthusiastic technical worker.

Sir Alexander Houston, in the *22d Annual Report of the Metropolitan Water Board of London, for 1927*, escapes the deadening influence of precedent by announcing in the beginning of his report:

> All water supplies in their origin are exquisitely romantic. Water evaporates from the ocean and condenses to form clouds. The clouds burst, and millions of drops of rain, the jewels of heaven, fall on the mountains and hills and valleys to give us our springs, lakes, rivers and subterranean sources of supply. . . . If you love the beauties of nature, simple things like the flow of water from a tap can carry you in imagination to the uttermost ends of the earth; the skies, the oceans and the mountains will be yours; and, if you pause nearer home in your flight, the kindly hills and peaceful valleys, which nurse the water supplies to the great metropolis, will surely gain an intimate place in your hearts.

Having thus deliberately escaped from the necessity of presenting his findings in the usual humdrum form and language of annual reports, Sir Alexander then carries his reader through some 80 pages of delightful comment upon water supply problems. And the strange feature of the report is that it contains valuable technical information so frequently and successfully disguised that even a layman might read it from cover to cover.

The report is liberally illustrated with photographs, the effectiveness of which would do justice to any limited edition of our current works of art. Even Sir Alexander, however, feels that he must make apology for producing an entertaining, albeit valuable, annual report. In his review of the upland sources of water supply for the City of London, he graces the pages with such comments as:

Then we reach Harpenden, perhaps the sweetest name in all England, for it means "the valley of nightingales." Miss Ellen Terry, one of the most charming and talented actresses the English stage has ever known, lived for some years at Harpenden. Nearby is the celebrated experimental agricultural station of Rothamsted, whose fame extends throughout the civilised globe. In far distant days, about a mile north, on the borders of the two counties (Hertfordshire and Bedfordshire) many prize fights were fought.

On the same page, however, he apologizes that—

This, however, is a treatise on water supply and some persons dwell in water-tight compartments. The Philistines welcome no digressions; they see only the open road straight in front of them. Perhaps they are right in ignoring all matters not wholly relevant. Others look to the beginning and end of things, the alluring surroundings of a subject, the association of ideas, the belief that there is nothing under the sun which is not related, in greater or less degree, to a thousand other things, which to unseeing eyes may seem to be irrelevant. These are the hill-top worshippers who regard everything in life as wonderful, and who, rightly or wrongly, fail to see why even questions of water supply should be ruthlessly shorn of all the elements of romance, and be regarded wholly and without sentiment as a matter of quantity, quality and financial expediency.

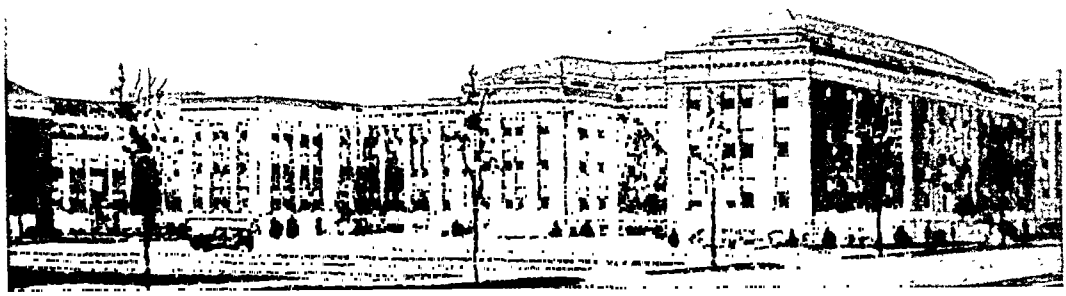
Space is not available to discuss at any greater length the technical matters of importance in this report, but the reader we hope will be allured by the prospectuses so briefly noted above, to review it in its entirety as a beacon light in the dull field of gray-backed annual reports.

PUBLIC HEALTH ENGINEERING SECTION—SCOPE AND POLICY

ATTENTION is directed to the report of the Committee on Scope and Policy of the Public Health Engineering Section published elsewhere in this issue* of the JOURNAL. The duties and responsibilities of the engineering group to the public health profession are clearly stated, the delineation of policies is clean-cut, and worthy of much consideration by other specialized groups of public health workers. Nurses, hygienists, publicists, educators, and laboratory workers all have much the same relationship to the public health field and other branches of their profession as is defined for the engineers in this report. Far-sighted policies of this nature, developed on a carefully planned program, will mean much to the public health profession.

* See page 677.

ASSOCIATION NEWS



PUBLIC HEALTH PAVILION, UNIVERSITY OF MINNESOTA

THE DEDICATION OF THE MINNESOTA PUBLIC HEALTH PAVILION

A PUBLIC Health Pavilion is in process of building on the medical campus of the University of Minnesota. Its completion is planned in season for the Annual Meeting in Minneapolis of the American Public Health Association, the American Child Health Association, and the related organizations of national and state origin, gathering at the same time.

The convention guests have been invited to attend the Dedicatory Exercises on Tuesday morning, October 1, at which the American Public Health Association will assist.

The program will open at the Public Health Pavilion at 9 o'clock on that date, when the guests will be guided in an inspection tour of the new University Hospital buildings. They will then regather at the Public Health Pavilion.

Dr. Lotus Delta Coffman, Chancellor of the University, will preside. He will give the welcoming address and will introduce C.-E. A. Winslow, Dr.P.H., Chief of the Anna M. R. Lauder Department of Public Health, Yale University, who will make the Dedicatory Address.

The gathering will then adjourn to the Cyrus Northrop Memorial Hospital, now approaching completion, where the exercises will be continued.

There Harold S. Diehl, M.D., Chief of the Department of Preventive Medicine and Public Health, of the University of Minnesota, will speak upon "The Evolution of the University Student Health Service."

The concluding address, upon "The Relation of the University to Public Health," will follow, for which the speaker has not yet been announced.

At the close of the program, the guests will be invited to attend a complimentary luncheon in the ball-room of the Minnesota Union, at 12:30 o'clock.

Time will probably permit of a guided excursion through the Main Campus of the University.

Minnesota ranks today as the fourth, in point of registration numbers, of all the great universities of the country, and third among the state universities.

Its college enrollment, for the past school year, was 15,851 and its subcollegiate registration 3,073. The Extension Division and Correspondence

Schools listed 8,790; making a total of unduplicated individuals of 25,895.

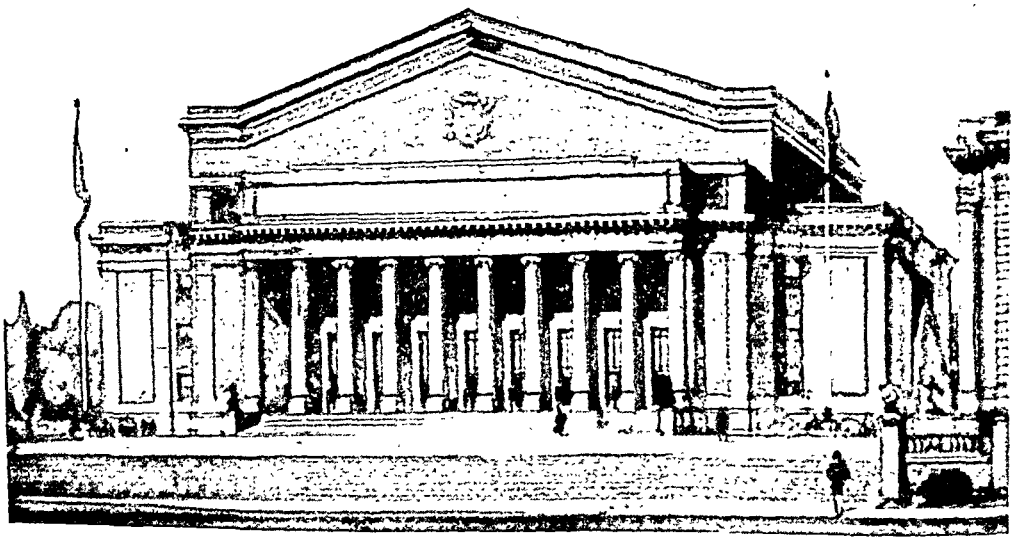
On its City Campus are 43 main buildings, housing the College of Science, Literature and the Arts, including the Departments of Animal Biology, Botany and Physics; the College of Engineering and Architecture; the School of Law, the Medical School, including the Central School of Nursing, the Institute of Anatomy, the Cancer Institute, the Todd Memorial Clinic and the Department of Medical Technology; the College of Dentistry and the School for Dental Hygienists, the Departments of Physical Culture, the School of Mines and Metallurgy, the School of Pharmacy, the School of Chemistry, the College of Education, the School of Business Administration, the School of Music, the University Library, the Graduate School, the University Hospitals, and the Administration Services.

At a distance of some three miles lies the Agricultural Campus with its 27 buildings, housing the College of Agriculture, Forestry and Home Economics; the Central School of Agriculture and the Agricultural Experiment Station.

There are Station Schools of Agriculture and Experimental Laboratories at Crookston, Morris and Grand Rapids; and sub-stations at Duluth, Waseca and Zumbra Heights.

The guests of the University of Minnesota will receive a cordial welcome on the University Campus.

NOTE: The Minneapolis Local Committee will be materially assisted if members and guests planning to attend the dedication exercises and to be its guests at the luncheon at Minnesota Union will kindly send their names and addresses to the Executive Secretary of the Committee, 324 Citizens' Aid Building, Minneapolis, Minn., at an early date.



CYRUS NORTHROP MEMORIAL AUDITORIUM, UNIVERSITY OF MINNESOTA

REDUCED RAILROAD RATES

Persons attending the 58th Annual Meeting of the Association and related meetings in Minneapolis, September 30 to October 5, will be granted a rate of one and one-half times a one way fare by the railroads from the starting point to Minneapolis and return.

To obtain the reduced rate it is necessary to obtain from the ticket agent a reduced fare certificate when purchasing your ticket for Minneapolis. Do not purchase your return ticket. This reduction is available to all delegates and members of their families attending the Annual Meeting of the American Public Health Association and meetings of the following related organizations:

American Child Health Association
American Social Hygiene Association
International Society of Medical Health Officers
Northwest Conference of Child Health and Parent Education
Minnesota State Sanitary Conference
Minnesota State Public Health Association
Minnesota State Organization for Public Health Nursing
Conference of State Sanitary Engineers
American Association of School Physicians

Ask for a certificate for the meeting of the A. P. H. A. and related societies. This certificate when validated by the Executive Secretary of the A. P. H. A. at the Minneapolis meeting will entitle the purchaser to a return ticket at half fare.

Detailed information regarding railroad rates and transportation will be sent to all members of the Association and related societies the first week in August.

RAILROAD RATES FROM VARIOUS CENTERS TO MINNEAPOLIS

	Regular Rate One Way	Special Rate Round Trip	Lower Berth	Upper Berth
Atlanta, Ga.	$41.13	$ 61.70	$10.88	$ 8.70
Baltimore, Md.	42.44	63.66	12.00	9.60
Boston, Mass.	50.90	76.35	12.75	10.20
Buffalo, N. Y.	33.47	50.21	9.00	7.20
Chicago, Ill.	14.66	21.99	3.75	3.00
Cincinnati, O.	24.92	37.38	6.38	5.10
Cleveland, O. (via Orrville)	27.37	41.06	7.50	6.00
Dallas, Tex.	35.50	53.25	12.00	9.60
Denver, Colo.	32.04	48.06	10.13	8.10
Detroit, Mich.	24.47	36.71	6.38	5.10
Indianapolis, Ind.	21.28	31.92	6.38	5.10
Jacksonville, Fla.	53.36	80.04	15.38	12.30
Kansas City, Mo.	17.90	26.85	5.63	4.50
Los Angeles, Calif.	75.99	113.99	23.63	18.90
Louisville, Ky.	24.92	37.38	6.38	5.10
Memphis, Tenn.	31.93	47.90	9.00	7.20
Nashville, Tenn.	30.72	46.08	8.25	6.60
New Orleans, La.	46.11	69.17	13.88	11.10
New York, N. Y.	47.36	71.04	12.75	10.20
Omaha, Neb.	12.69	19.04	3.75	3.00
Philadelphia, Pa.	44.12	66.18	12.00	9.60
Pittsburgh, Pa.	31.54	47.31	8.25	6.60
Portland, Ore.	64.66	96.99	19.88	15.90
Salt Lake City, Utah	49.83	74.75	15.38	12.30
San Francisco, Calif.	75.99	113.99	23.63	18.90
Seattle, Wash.	62.56	93.84	19.88	15.90
St. Louis, Mo.	20.74	31.11	5.63	4.50
Toronto, Can. (via Chicago)	31.98	47.97	9.38	7.50
Washington, D. C.	42.44	63.66	12.00	9.60

Summer tourist tickets, which are on sale from May 15 to September 30 and bear the final return limit date, October 31, are in some cases cheaper than the regular convention fare. This is particularly true of the West. Consult your local agent.

VITAL STATISTICS CONFERENCE

According to an announcement by the U. S. Department of State on April 15, the United States Government will participate in an international conference to consider the revision of international classifications of the causes of death. This conference will take place in Paris in October of this year. The following have been appointed as delegates from the United States: Timothy F. Murphy, M.D., Chief Statistician for Vital Statistics, U. S. Bureau of the Census; Haven Emerson, M.D., Chairman, Committee on Accuracy of Certified Causes of Death and its Relation to Mortality Statistics and the International List, A. P. H. A.; George H. Van Buren, Chairman, Vital Statistics Section, A. P. H. A.; William H. Guilfoy, M.D., Chairman, Committee on Forms and Methods of Statistical Practice, A. P. H. A.;

W. J. V. Deacon, M.D., Chairman, Committee on Vital Statistics Training, A. P. H. A.; Jessamine S. Whitney, Statistician, National Tuberculosis Association; Rupert Blue, M.D., Assistant Surgeon-General, U. S. Public Health Service; Emlyn Jones, M.D., Chief, Bureau of Vital Statistics, Pennsylvania Department of Health; and Edgar Sydenstricker, Milbank Memorial Fund.

MINNESOTA STATE SANITARY CONFERENCE TO MEET WITH A. P. H. A.

At the 27th Annual Meeting of the Minnesota State Sanitary Conference held last month in Minneapolis, the conference decided to hold its 28th Annual Meeting at the time of the 58th Annual Meeting of the A. P. H. A. in Minneapolis, Minn., the week of September 30, 1929.

ARIZONA PUBLIC HEALTH ASSOCIATION

The Arizona Public Health Association held its meeting in Prescott, Ariz., April 16 and 17. The following were elected officers for the ensuing year: *President,* Harry T. Southworth, M.D., Prescott; *First Vice-President,* George Grove, Tucson; *Second Vice-President,* Arthur J. Kline, Prescott; *Secretary-Treasurer,* Jane H. Rider, Tucson; *Executive Committee,* H. A. Reese, M.D., Helene Thomas Bennett, W. J. Jamieson and G. F. Manning, M.D.

The association indorsed the invitation of the Texas Association of Sanitarians to the American Public Health Association to hold its 1930 convention in Texas.

DEATH OF EDITH HEDGES MATZKE

Edith Hedges Matzke, M.D., died very suddenly on April 7 at the Stanford University Hospital in San Francisco.

Dr. Matzke obtained her degree of M.D. at the Women's Medical College of Pennsylvania and her degree of Dr.P.H. at the School of Medicine, University of Pennsylvania. During her professional career she was associated with the following institutions: Stanford University, Cornell University, Inter-departmental Social Hygiene Board; University of Missouri, Women's Medical College of Pennsylvania, and the Health Clinic of College Hospital, Philadelphia, Pa. At the time of her death, she was actively engaged in private practice in San Francisco, Calif.

Dr. Matzke was a Fellow of the American Public Health Association and of the American Medical Association and a Collaborating Member of the American Social Hygiene Association. Previously she took an active part in the State Medical Societies of Pennsylvania, New York, Missouri, and California.

ASSOCIATION DELEGATES TO INTERNATIONAL CONGRESS

The American Public Health Association appointed as delegates to the International Congress of Public Health held in Zurich, Switzerland, May 15–20, Francis E. Fronczak, M.D., Commissioner of Health of Buffalo, N. Y., and Benjamin S. Stephenson, M.D., Health Commissioner of Shelby County, O.

TUBERCULOSIS CLINIC RECORD FORMS

The Sub-Committee on Record Forms of the Committee on Administrative Practice of the A. P. H. A. has prepared for distribution sample copies of a set of 5 tuberculosis record forms which may be considered as minimum standard forms.

The set consists of a family folder which affords space for recording the make-up of the family, a medical examination form for recording the individual medical history of each patient on his first visit to the clinic, a reëxamination form, a monthly report form, and an index card which contains

enough information to be usable as the basis of the monthly report.

The index card takes the place of the old fashioned ledger or day book, which can be dispensed with. Copies of this tentative set of forms may be obtained by writing to the American Public Health Association.

NEW MEXICO PUBLIC HEALTH ASSOCIATION

The Fifth Annual Meeting of the New Mexico Public Health Association was held at Carlsbad, N. M., May 2–4. The following were elected officers for the coming year: *President,* James R. Scott, M.D., Albuquerque; *Vice-President,* Edith Hodgson, R.N., Santa Fe; *Secretary-Treasurer,* Paul S. Fox, Santa Fe.

The association passed a resolution endorsing the Standard Milk Ordinance of the U. S. Public Health Service and recommending that the State Board of Public Welfare give its endorsement to this ordinance and urge its adoption by all larger municipalities in the state.

NEW MEMBERS

Edgar F. Allen, Elyria, O., President, International Society for Crippled Children (Assoc.)

Helen A. Bigelow, R.N., Fulton, N. Y., Public Health Nurse

Henry F. Burt, A.B., Providence, R. I. (Assoc.)

Dorothea Campbell, Charleston, W. Va., Director, Bureau Public Health Education, State Department of Health

Thomas H. Chesnutt, M.D., Moultrie, Ga., Commissioner of Health

Josephine L. Daniel, R.N., Jefferson City, Mo., Field Demonstration Nurse, State Board of Health

Vernon A. Douglas, M.D., Salem, Ore., City-County Health Officer

Louise E. Drake, B.S., Athens, Ga., Director of Health, State Teachers' College

Charles H. Eastwood, Jacksonville, Fla., Public Health Engineer, Wallace & Tiernan Co., Inc.

Leo F. Ey, Columbus, O., Acting Chief, Division of Laboratories, State Department of Health

Cameron St. Clair Guild, M.D., Tupelo, Miss., Director, County Health Department

Lillian R. Hamrick, Charleston, W. Va., Staff Nurse, Kanawha County Health Unit

Beatrice A. Harvey, R.N., Gering, Neb., School Nurse

Alma C. Haupt, New York, N. Y., Associate Director, Rural Hospital Division, Commonwealth Fund

Frank R. King, Madison, Wis., Director, Bureau of Plumbing, State Department of Health

Francis L. Love, Iowa City, Ia., City Health Officer

Joseph S. Maxwell, M.D., Beckley, W. Va., Health Officer of Raleigh County

Jere J. McEvilly, M.D., Little Falls, N. Y., Medical Inspector, Board of Education

Peter H. McNellis, M.D., Los Lunas, N. M., Field Agent, U. S. Public Health Service

Eugene E. Murphey, M.D., Augusta, Ga., President, Board of Health

Margaret L. Plumley, B.A., Chicago, Ill., Research Worker, Julius Rosenwald Fund

Evalina D. Reed, R.N., Provo, Utah, Supervising Nurse, Utah County Health Unit

Dr. George L. Schadt, Springfield, Mass., Laboratory Director, New England Laboratories

Edmund Schreiner, Albany, N. Y., Assistant Director, Division of Vital Statistics, State Department of Health

Byron W. Steele, M.D., Mullens, W. Va., County Health Officer

Eldred V. Thiehoff, M.D., Akron, O., Chief, Child Hygiene Service, City Health Department

E. T. Wetzel, West Union, W. Va., County Health Officer

DECEASED MEMBERS

D. E. Musgrave, M.D., Barboursville, W. Va. Elected member 1921

Ira W. Pickett, Cristobal, C. Z. Elected member 1921

Edith H. Matzke, M.D., Dr.P.H., San Francisco, Calif. Elected member 1921—Fellow 1923

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Summer Camps in Massachusetts—The Massachusetts State Department of Public Health recently asked for a camp licensing law, which failed to pass the legislature. The department is now offering to local health officers and camp authorities minimum standards for the health and sanitary conduct of their camps. These standards have been drafted by a committee of health officers and camp directors and approved by the Massachusetts Association of Board of Health, the New England Camp Directors Association, and the Massachusetts State Department of Public Health.

Every camp should be provided with a water supply of good sanitary quality and of sufficient quantity. Where available, flush toilets should be used. Where this is impossible, camps should be provided with suitable equipment for the disposal of sewage. No privy or receptacle for sewage or garbage should be located within 200 feet of any well or spring. The location of all sanitary conveniences should be clearly indicated to tourists. There should be proper receptacles for garbage, rubbish and other refuse. All living quarters, dormitories, kitchens, etc., should be properly screened. There should be a caretaker in charge.

For organizational and private camps, medical supervision is recommended, including a complete physical examination for each camper before starting for camp. Where there is no resident physician, arrangements should be made with at least two neighboring physicians to supply professional service when needed. There should be evidence of successful vaccination against smallpox, and typhoid fever immunization should be urged. Negative stool and urine specimens and a Widal should be required of the entire food handling personnel. All under 15 years of age should have a Schick test before going to camp, and active immunization is urged for all positive reactors. There should be daily medical inspection at camp and careful observation during the two weeks immediately following the opening of camp. The director should impress on the minds of the campers the dangers of contracting typhoid fever by drinking casually from brooks and ponds which are not known to be safe. Visiting should be limited as far as practicable. All milk used should be adequately pasteurized. So far as possible physical defects should be corrected before going to camp. There should be proper supervision of rest periods and courses of exercise. A definite food service is recommended incorporating a well balanced and healthful diet.

Diphtheria Prevention in New York City—The diphtheria prevention commission of the Department of Health in the City of New York has prepared, with the coöperation of the Milbank Memorial Fund, a book, *How to Protect Children from Diphtheria—A Handbook of Information*, which outlines the program inaugurated January, 1929. This booklet, copies of which can be obtained from Shirley W. Wynne, M.D., Commissioner of Health, is of historical value in that it outlines the progress of diphtheria control work in New York over a period of years. It contains numerous reproductions of

editorials which have appeared in the various newspapers. A list of stations at which immunization may be secured by parents is also included.

Inconsistent Hospital Death Records—The importance of accuracy in death records and statistical surveys should be apparent to everybody, and also the fact that misstatements are frequently worse than no statement at all.

In connection with a statistical survey of cancer prevalence in Pennsylvania, the hospitals of this state were requested to report the number of deaths from cancer occurring in such institutions during 1927. Seventy-four of the 239 institutions replying to the questionnaire gave the desired information, and in this group the original death certificates indicated 18 per cent more deaths from cancer than acknowledged on the questionnaire. Additional information was obtained by personal visit to the hospitals of Philadelphia and Pittsburgh, increasing the number of reporting institutions to 117, of which number 67 reported 411 fewer and the remaining 50 claimed to have 107 more cancer deaths than the original certificates indicated.

These discrepancies indicate the danger of placing too much confidence in data collected by the questionnaire method and suggest a lack of dependence upon such system for formulating definite conclusions. The inaccuracies were due to incomplete hospital records, to irregular methods of keeping such records, or to guesswork by the hospital record clerk in supplying the needed information. In a few instances the discrepancies were due to the selective methods of statistical practice in classifying causes of death. For instance, a man with intestinal carcinoma may be regarded by a hospital as dying of appendicitis or intestinal obstruction, but his death when classified by a statistician may be placed among the cancers. For purposes of statistical classification cancer is given preference over such important diseases as diabetes and tuberculosis, which might be regarded by hospital physicians as the actual cause of death.

Hospital records will show more deaths in hospitals than the state records, when the persons who make out the death certificates fail to put down the name of the hospital. This omission has been found to occur frequently. Hospital executives should be informed that all birth and death certificates used for hospital patients should be made upon blank forms kept in such institution. The name of the hospital should be distinctly written or printed on all blank certificates previous to their use. The diagnoses as recorded on the death certificates should correspond with the diagnoses entered upon the hospital records and in all instances the recorded information should be complete.—Harold B. Wood, M.D., Epidemiologist, State Health Department, Harrisburg, Pa.

LABORATORY

C. C. YOUNG

A COMPARISON OF SEITZ AND MANDLER FILTERS

N. W. LARKUM, PH. D.

Michigan Department of Health, Lansing, Mich.

ONE of the interesting and significant phases of the trend of bacteriology during the past ten years has been the emphasis placed upon filtration as a means of removing bacteria from fluid media. The study of bacteriophagy, the investigation of bacterial life cycles, the isolation of viruses, and the preparation of media, of antigens, and of antiviruses, have involved the use of filters to such an extent that apparatus of this kind must now be considered as an essential item in the equipment of a laboratory. In view of this fact, the selection of filters becomes a problem of some magnitude, which at present cannot be settled by the consultation of literature.

Although much valuable investigation of the physico-chemical properties of filters has been published, such reports have little direct application to the question of choice between several types of filters listed by supply houses. As a matter of fact, until quite recently there was probably little to influence one's choice. The advantages of one type were offset by its disadvantages and the issue was decided by the previous experience of the user.

The introduction of the Seitz filter, if the claims of the manufacturers and distributors can be accepted, has upset this equilibrium. So great is the apparent advantage of this filter that for many purposes it should entirely replace other types. The claims are based upon several published articles which, however, are not conclusive. They do justify a more careful and complete study. Such a study has been made, largely by comparison of Seitz and Mandler filters. The results are summarized and presented here.

The great advantage of the Seitz filter is that it is used once and discarded, thus obviating the necessity for cleaning and avoiding the difficulties attending incomplete removal of the chemicals used. Against this advantage must be checked the cost of sterile filtrate produced. Such a study entails a knowledge of the life of a Mandler filter and of the amount of sterile filtrate which a Seitz and a Mandler filter will yield. The former question is difficult to study by direct methods since it is obvious that too many factors must be taken into consideration.

Experience over several years during which Mandler filters 1″ x 3/8″ were largely used furnishes a basis for estimate which has been checked by a limited number of experiments. The average life of a Mandler candle of this size is about ten filtrations, irrespective of the amount of material filtered. There are individual candles with much longer lives, and there are many that are used after they should have been discarded. Certainly the bubble test as an indication of the value of a candle in giving a sterile filtrate is useless. The majority of candles end their career through breakage. Table I shows the record of twelve candles:

TABLE I

MANDLER SIZE 1" x 3/8"

No.	Test	Times Used	Amount Filtrate Sterile	Total	Fate
1	8 lbs.	8	1,400 c.c.	4,600	Broken
2	8	3	2,597 *	3,584	Broken
3	8	4	1,103	4,210	Discarded—leak
4	8	3	1,430	4,380	Broken
5	5	3	0	1,547	Discarded—no sterile filtrate
6	6	12	3,120	6,000	Broken
7	6	11	2,117	5,888	Discarded—leak
8	6	1	0	1,958	Discarded—poor filter
9	9	4	494	3,284	Discarded—leak
10	9	20	400	400	Still in use
11	9	6	180	180	Broken
12	9	8	240	240	Broken
Total		83	13,081	36,271	
Average		7	160 c.c.	437 c.c.	

* 2,211 c.c. of this total was sterile media before filtration.
Used to check air leaks in apparatus.

Thus an actual record of the life of several Mandler candles checks closely with the estimate. Other workers might obtain somewhat better results although it is scarcely possible that the difference would be great.

The amount of sterile filtrate obtained is not the maximum, for in many instances from 10 to 20 c.c. only were passed through the candle. In order to study this factor, comparative tests of Seitz and Mandler filters were run under identical conditions. Positive pressure was used and samples were collected every few minutes and tested for sterility. *B. typhosus* and staphylococcus were the cultures used. The results are given in Table II.

These figures are subject to considerable interpretation and might be analyzed more extensively than is possible here. The only conclusion that can be reached is that the Seitz equals or betters the record of the Mandler filter with respect to quantity of sterile filtrate. It is of interest to note further that one can depend upon this 20 c.c. size Seitz filter to yield from 100 to 200 c.c. of sterile filtrate. With the Mandler, one guess is as good as another as to the amount of sterile filtrate one may obtain. Again, experience in daily use of such filters checks these findings.

Over several years during which Mandler and Berkefeld filters were used for about ten filtrations daily (average amount of 50 c.c. to each filtration), I found that about 4 per cent of filtrates were contaminated in spite of all precautions. Seitz filters have been used in a similar manner during the past two years, and although the average amount filtered was greater, the percentage of contaminations has been reduced to less than 1 per cent.

Without taking into consideration the factor of time spent in cleaning, comparative costs decidedly favor the Seitz filter. Such costs can only be figured on the basis of cost per c.c. of sterile filtrate. The Seitz filter of the size used here costs $10, subject to discounts. Since, however, the metal parts are practically indestructible, this cost can be distributed over so many c.c.'s as to become negligible. The filter discs are listed 5 cents, subject to discount. One disc gives 390 c.c. of sterile filtrate; so

TABLE II

MANDLER

Filtration	Pressure mm. Hg	No.	Test mm. Hg	No. c.c. Sterile Mandler	Seitz
1	260	9	260	588	389
2	180	9	240	0	13
3	460	9	280	0	109
4	520	12	520	227	232
5	780	12	520	721	810
6	780	12	520	224	242
7	780	12	520	82	493
8	780	12	520	309	214
9	780	13	540	156	462
10	780	13	540	265	133
11	780	13	540	343	215
12	780	13	540	722	585
13	780	13	540	142	367
14	780	14	320	0	573
15	780	15	430	0	133
16	780	15	430	493	862
17	780	15	430	722	584
18	780	15	430	0	608
			Total	4,994	7,024
			Average	277 c.c.	390 c.c.

1 c.c. of filtrate costs less than 0.2 cents. Mandler filters list at $1.25 and have an average life of 10 filtrations. The average amount of sterile filtrate is 277 c.c. The cost per c.c. of sterile filtrate is nearly 0.5 cents. Thus the Seitz filter is about half as expensive as the Mandler. Whether this comparison would hold where larger sizes are concerned it is impossible to state on the basis of these data.

The cheapness of operation is not the sole consideration in the selection of filters. Differences in adsorptive capacities may render a given type unfit for certain uses. Because the composition of the Seitz filter differs from that of the Mandler, it may adsorb substances which the latter does not. So far as charge is concerned, both filters are alike (negative), retaining Victoria blue and allowing passage of Congo red. The Seitz, however, will remove about twice as much dye as the Mandler. Bacteriophage is not affected by passage through the Seitz filter.

The question of rate of filtration is directly associated with the problem of amount of sterile filtrate obtained, for time is certainly a factor in contamination. The statement is made by the distributors that Seitz filters are more rapid than other types. This is true when distilled water is filtered; with turbid fluids there is very little difference. The more rapid the filtration, the more quickly occurs the clogging of the pores and the consequent slowing of flow. If the quantity of fluid to be filtered is less than 50 c.c., there will be a slight saving of time by the use of the Seitz filter.

Another superiority which is claimed for the Seitz filter is the smaller loss of fluid due to retention in the pores. Records of a considerable number of filtrations show that these small filter plates adsorb about 2.5 c.c. of fluid. Some of this may be forced out by continuation of pressure when no visible fluid remains in the filter. This is done at the risk of contamination, however.

The average loss of fluid with the Mandler filter is 4.5 c.c. When small quantities of distilled water are passed through a Seitz disc, size 3, the minimum loss is 1.1 c.c.

Nothing has been said thus far regarding technic, although it is certain that the human factor can considerably influence the results. The writer's technic, so far as Mandler filters are concerned, may be subject to criticism just as is that of many Seitz users who have reported difficulties. The Seitz filter, having fewer parts and no rubber fittings, is decidedly less liable to permit contamination due to errors in technic.

SUMMARY

A careful study of the comparative efficiency of Seitz and Mandler filters has shown a distinct superiority for the former. The rate of filtration and amount of yield have shown some advantages for the Seitz. The adsorptive capacity of the two filter types is essentially identical. For many purposes the Seitz filter is unquestionably cheaper and more satisfactory than the Mandler.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Sex Factor in Infant Mortality—During the 10-year period from 1915 to 1924 inclusive, there were from 130 to 134 deaths from all causes among white male infants under 1 year of age, as compared with 100 deaths among white female infants in the U. S. Registration Area. An analysis of white infants in the birth registration area for the years 1918 to 1921 showed a high mortality sex ratio during the first month of life, a rise during the second month, and then a gradual decline in the ratio. It is found that the decrease in the ratio as age increases is due to a decrease in the susceptibility of the male, when the ratios for various groups of diseases are compared at various age divisions. The mortality sex ratio for diarrheal diseases among white infants for the years 1916 to 1921 in the birth registration area was 138 for the first month, 141 for the second month, 136 for the third month and 120 for the tenth to the twelfth months. After the first year of life the ratio continues to fall, so that during the fourth year the death rate for both sexes is about equal. Countries where the infant mortality rate is low have a high mortality sex ratio and those with high rates have a low ratio. Australia with an infant mortality rate of 69 in 1922 had a mortality sex ratio of 120, as compared with Chile, which had an infant mortality rate of 240, and a mortality sex ratio of 106.

Various environmental factors have been found to influence the mortality sex ratio. The relationship between infant mortality rate and the sex ratio in different regions varies. Thus for an infant mortality rate of 80 the sex ratio in England and Wales was 129 for the years 1841 to 1924, as compared with 122 in Sweden for the years 1751 to 1920. The mortality sex ratios for cities tend to be higher than for rural communities. Seasonal variations also occur in the mortality sex ratio. Between 1918 and 1922 the ratio for deaths from all causes showed a rise, starting in November and December, reaching a maximum in February and March, and then falling during the summer months. A similar seasonal

fluctuation occurred for pneumonia and for diarrheal diseases. The pneumonia ratio varied from 143 in February to 115 in August, and the diarrhea ratio varied from 141 in April to 122 in September. It is suggested that the regional and seasonal variations in the mortality sex ratio are dependent on the differences in the amount of sunlight reaching the infant. The greater need of the male infant for sunlight is indicated by his tendency to develop conditions such as tetany and rickets due to the instability of the calcium regulatory system.—Harry Bakwin, *Human Biology*, 1: 90–116 (Jan.), 1929.

All Benefit from Health Work—During the 20 years in which the Metropolitan's Welfare Division has functioned, the mortality of the company's industrial policyholders has declined at a rate twice as great as that in the general population. This is an important achievement; but even more important is the fact that the gain has extended to all age periods of life and to both sexes.

In early childhood, that is, at ages 1 to 4 years, the margin in favor of the insured, although considerable, is smaller than at all later age periods. But after age 5, this margin is very striking. At ages 10 to 14, 35 to 44, and 45 to 54 among males, and 15 to 19, and 45 to 54 among females, the drop in mortality among the insured approximated twice that for the general population. At ages 55 to 64, the improvement among the insured males was five times that shown for the general population, while among females it was more than 18 times as great. At ages 65 to 74, the insured registered substantial declines, although the death rate actually increased in the general population for each sex. It is particularly significant that, whereas the mortality of persons after 55 in the general population has either improved very slightly or has actually increased, the death rate among the insured has shown consistent, substantial declines. It is for this reason that the expectation of life of the insured, at the higher ages, is still increasing, while that of the general population stays near the earlier level.—*Stat. Bull.*, Met. Life Ins. Co., 10: 7–8 (Mar.), 1929.

An Inquiry into Asthma—An analysis was made of the records obtained from 404 patients suffering from asthma who were investigated by the Royal Infirmary of Edinburgh during the past 8 years. The first appearance of asthma was before the age of 20 in over 50 per cent of the cases. Of 139 cases in whom inheritance of asthma was noted, 59.6 per cent began to have the disease before the age of 20. Over 80 per cent of the patients were suffering from some respiratory infection just before the asthma started. Seven per cent of the patients had suffered from digestive disorders, 12.6 per cent from nasal conditions, 4.6 per cent from psychic disturbances, and 5.7 per cent from skin disease. Exposure to dust was recognized as an aggravating factor by 48 per cent of the cases. In about 13.5 per cent of the cases, asthma was due to exposure to pollen. Protein skin tests were tried out in 300 patients, and 50 per cent of these gave positive results. About 35 per cent of the patients stated that their attacks of asthma were quite independent of the weather. Among 65 per cent, cold and damp appeared the most likely weather condition to bring on the disease, and about 18 per cent of the cases objected to dry or warm weather. A certain proportion of the patients found that their asthma was definitely seasonal, the majority of the asthmatics being worst in winter and summer. Among 101 cases, the first onset of asthma was in the winter, among 90 cases in summer, among 63 in autumn and among 61 in spring. Nineteen per cent of the patients claimed

their asthma to be worst when at the seashore, 14 per cent when in the country, and 11 per cent when in the city. Psychic disturbances such as fright, worry or emotion induced attacks in 40.6 per cent of the cases. Of 112 females of active menstrual age, 46 per cent found their asthma worse at, or just before the period. Examination of the nose and throat was carried out in 299 cases on first reporting at the hospital. Nasal abnormalities were present in 63.1 per cent of the asthmatics examined.

The analysis of the case records has demonstrated the enormous importance of respiratory infections in the production of asthma in this district. It has also shown that the tendency to develop the disease at different periods of life is more uniform than was previously supposed.—*Lancet*, 1: 517–518 (Mar. 9), 1929.

Health of the American Indian—There are approximately 350,000 Indians in this country, and about 225,000 are wards of the government. Medical service has been provided for these Indians by the government since 1873. The general death rate among the Indian population for which there are records is about twice that for the U. S. Registration Area. In 1911 there was an Indian death rate of 35.6 per 1,000 population, as compared with 23.4 for negroes and 13.8 for whites. In 1924 there was an Indian death rate of 22.9, as compared with 17.8 for negroes and 11.2 for whites. Indians have the highest birth rate as well as the highest death rate among the three races. In 1915 there was an Indian birth rate of 35.3 per 1,000 population, as compared with 20.6 for negroes and 25.0 for whites. In 1924 there was an Indian birth rate of 31.5, as compared with 27.4 for negroes and 22.2 for whites. The death rate from tuberculosis among the Indians of the United States is today estimated to be more than four times the death rate from this disease among the white population. This is due in part to lack of racial immunity, unhygienic living conditions, and an inadequate or poorly balanced diet. From July to December, 1927, 25.4 per cent of the deaths among Indian wards of the government were from tuberculosis; 5.7 per cent were from pneumonia; 4.4 per cent were from diarrhea and enteritis under 2 years; and 4.8 per cent from violence. Trachoma has been prevalent among the Indians of the United States for many years. The incidence of this disease varies from 2 per cent in certain states to 20 per cent in groups in the Northwest. The prevalence of venereal disease is reported as slight, and does not constitute a factor in the health situation among most of the tribes. About 10,000 Indians have been vaccinated against smallpox, 4,000 against typhoid fever; and nearly 15,000 children have been protected against diphtheria by the administration of toxin-antitoxin.—M. C. Guthrie, *Pub. Health Rep.*, 44: 945–957 (Apr. 19), 1929.

The Health of Palestine and Trans-Jordania—A report was recently presented to the Council of the League of Nations by H. M. Government, on the administration of Palestine and Trans-Jordania for 1927. Palestine was comparatively free from epidemics of the more serious diseases. There were 1,001 cases of enteric fever with 76 deaths. Dysentery caused 1,782 cases and 31 fatalities. No cases of plague or cholera were reported. One case of smallpox occurred in Jerusalem, and as a consequence 34,000 inhabitants underwent vaccination. There were 3,305 cases of measles resulting in 324 deaths. The estimated population for 1927 was 778,369. There was a

birth rate of 50.4 per 1,000 population as compared with 53.5 in 1926. The highest birth rate of 56.1 occurred among the Moslem population, and the lowest of 35.1 among the Jewish. The general death rate was 28.0 per 1,000 population, as compared with 24.4 in 1926. There was an infant mortality rate of 201 per 1,000 live births. The highest rate of 217 occurred among the Moslems, as compared with the lower rate of 116 among the Jews.

In Trans-Jordania there occurred 66 cases of enteric fever with 6 deaths during 1927; 34 cases of influenza with 6 deaths; 66 cases of dysentery with 2 deaths; 154 cases of measles with 30 deaths; 37 cases of pneumonia with 7 deaths, and 14 cases of erysipelas with 1 death. There were single cases of smallpox and diphtheria which were imported. The steps taken to protect water supplies from contamination noticeably reduced the incidence of enteric fever and dysentery.—*Lancet*, 1: 592 (Mar. 16), 1929.

Gall-bladder Disease—An analysis from the standpoint of postoperative results was made of 109 cases of gall-bladder disease operated on at the Free Hospital for Women, Brookline, Mass., between 1905 and 1926. Tuberculosis and cancer were each found in 6.4 per cent of the family histories. Seventy per cent of the patients had undergone operations of some kind. Typhoid fever was found in 11 per cent of the past histories, and gall stones had been noted present in 8 patients at previous operations. Ninety-two and six-tenths per cent of the patients were married, and 83.5 per cent of these had borne children. The onset of symptoms of gall-bladder disease was definitely related to pregnancy in 18.6 per cent of these patients. The predominant age of onset was found to be from 25 to 40 years, and the majority of operations were performed between the ages of 30 and 45 years. The duration of symptoms in most cases covered a range of from 1 month to 21 years. No deaths occurred among the 109 patients submitted to operation. In 80 per cent of the cases the convalescence was uneventful.

A follow-up of the cases brought information from 72.5 per cent. Sixty-eight of these had postoperative intervals of at least 2 years, 49 of 5 years, 42 of 8 years, 29 of 10 years, and 17 of 12 years. Ten deaths were reported, none of which was directly traceable to operation. Complete relief from symptoms was reported by 60.8 per cent of the patients, more among those with cholecystectomy than cholecystostomy. Twenty-eight per cent had occasional digestive upsets, and 11 per cent reported recurrence of typical gall-bladder attacks. Inability to eat certain foods, especially fats and fried foods, was reported by 19 per cent of the cases. Five per cent had symptoms probably due to obstructing adhesions. Twenty-five patients reported gains in weight of from 10 to 65 pounds. Twenty patients stated that there were no hernias in the gall-bladder scars, and two reported some bulging in that region. Fifty-seven cases failed to mention hernia.—George A. Marks, The Late Results of Operation in 109 Cases of Gall-Bladder Disease, *New England J. Med.*, 200: 587–592 (Mar. 21), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

SCOPE AND POLICY *

PUBLIC health engineering may be defined, briefly, as the practice of those engineering arts which affect public health, or, more elaborately, as the application of the laws of science, including those of physics, chemistry, and biology, to the betterment of man's environment. One of the best descriptions of the field of public health or sanitary engineering may be found in the address given by Harrison P. Eddy before the Sanitary Engineering Division of the American Society of Civil Engineers. After reading this, one is better able to visualize the intimate relationship between engineering practice and the improvement of the public health.

It has been a long time since public health work was exclusively of a medical nature and it would be as absurd to expect a man with only one kind of training to be proficient in all kinds of public health work as it would be to expect a modern priest to heal wounds and build bridges as did his ancient prototype.

Specialization in public health work has been growing; the present make-up of this Association indicates that growth and its diversity better than anything else. During the latter part of the last century, there were in the Association but few chemists, bacteriologists, social workers, or vital statisticians, and there were no nurses nor child hygienists. Meetings were rather formal and the subjects discussed now seem odd. Nevertheless, the quality of the workers and the work done were excellent and we look back with pride upon the early meetings.

The laboratory workers were the first to form a section; then came the others in turn until we now have a number of groups of specialists.

It should be the paramount aim of each section to serve not only its own particular group of specialists but also the Association. One of the principal ways in which the Association may be served is by extending to the groups in other sections sources of information, thereby permitting them to benefit. On the other hand, the engineers making up this section should be expected to benefit by their contacts with those who are primarily interested in administration, medical, or educational phases of public health work.

It is, therefore, an important function of the Public Health Engineering Section to conduct its meetings so that the results of engineering work may be presented to the lay and professional members of the association in an understandable manner. This means that this section is not the place for papers on hydraulics, mechanics, or details of engineering construction, but for those which connect engineering methods and accomplishments with public health work.

Engineering societies, associations of water works men, and sewage works associations offer the best outlets for technical papers in those fields. This sec-

* Progress report of the Committee, presented at a Luncheon Session of the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

tion's meetings should be the place for interpretive and educational papers on the relationship between the engineering arts and the improvement of the public health.

The field of work of the members of the Conference of State Sanitary Engineers is very closely related to that of the members of this section, and it is the hope of the committee that in the future the meetings of this Conference may be more closely associated and coordinated with those of this section.

Even with the relegation of highly technical papers to other associations, there still remains a group of engineering subjects which need consideration and which have no forum other than this section in which they may be presented. The committee refers here to such works as drainage, shellfish sanitation, rat extermination through better building construction, ventilation, housing, and others. Until these lines of work develop to where each has its own parent association where it may be discussed, this section should provide for the proper expression of results of work in these respective fields.

Some thought should also be given to the desirability of preparing manuals of practice, like the *Standard Methods of Water Analysis* fostered by the Laboratory Section. Although there seems to be no particular need for this work at present, the future may indicate the necessity for such manuals of procedure.

It is only rarely that the engineer becomes a mouthpiece of public health information. That function should be relegated to other workers, such as the health officer or the teacher, both of whom come in direct contact with the public; whom the public understands; and to whom it looks for authoritative information. The assumption of this attitude does not place the engineer in a position of servility, nor does it cause the loss of any professional dignity, for no one recognizes the contributions of engineers to the improvement of public health or is more dependent upon engineers for counsel and assistance than the modern conscientious health officer.

The scope of activities of this section, therefore, should include the zone where engineering borders upon public health and the policy should be to serve its members daily by informal contact, and the Association by bringing engineering results and methods into public health work and to the attention of public health workers.

That such service will benefit the server even more than the served is the experience of the human race.

R. S. WESTON, *Chairman*
EARLE WATERMAN
W. F. WELLS
V. M. EHLERS
ABEL WOLMAN

Lethal Effect of Chloramine on Mosquito Larvae—The subject is dealt with from the water purification point of view, but the investigations cover only rain water with a single species of larva. The primary object of the tests was to ascertain if it were possible to eliminate larvae from a water by means of chemicals without affecting its potability. Tables of concentrations and the effects of chloride of lime and ammonium sulphate, applied together, and of other chemicals are given. The results show that (a) it is possible to kill mosquito larvae in a water by means of chemicals which are ordinarily used in water treatment; (b) in a water chemically very impure, mosquito larvae (*C. pipiens*) are killed in 24 hours by a concentration of 1 in 50,000 (expressed as Cl) of a mixture of chloride of lime and ammonium sulphate; (c) if such

treatment is followed by the addition of sodium hyposulphite, the water has no obnoxious odor or taste; (d) with chemically purer waters, lower concentrations of chloramine would be effective.—B. A. Adams, *Med. Off.*, 65, 1928. (From papers of Water Pollution Research Board, England.)

Purification of Sewage Containing Large Amounts of Dyestuffs by the Activated Sludge Process—Laboratory experiments show that the activated sludge process is capable of removing the septicity of sewage containing dyestuffs but that the complete removal of the dyes necessitates other means of purification, such as filtration through clinker.—Pritzkow and Jordan, *Wasser u. Gas.*, 18: 553, 1928. (From papers of Water Pollution Research Board, England.)

Bacterial Pollution of Bathing Beach Waters in New Haven Harbor—A study was made of the pollution of water in the New Haven harbor at bathing beaches. Eleven sampling stations were established on the West shore, 3 in the Quinnipiac River and 16 on the East shore. Samples were collected at each harbor station on eleven different days in the period from November, 1926, to April, 1927.

There is a sketch of the harbor showing location of the sampling points. All samples were (a) plated on plain nutrient agar for incubation for 48 hours at 20° C.; (b) plated on eosin-methylene-blue agar for incubation for 36 hours at 37° C.; and (c) inoculated in 0.1 and 0.01 c.c. dilutions of lactose broth for incubation at 37° C., and subsequent examination of tubes showing gas for *B. coli*.

The results are recorded in tables for comparison at the various stations. The direction of the wind is given as the chief factor in the pollution of these bathing beach waters.

Among the conclusions drawn are that the bathing beach waters of New Haven harbor are highly polluted and at certain points are so heavily polluted as to be manifestly unfit for bathing. A comparison is made in this article between the results of this study and the limits set by the Conference of State Sanitary Engineers and the standard generally accepted in the State of California.—C.-E. A. Winslow and David Moxon, *Am. J. Hyg.*, 8, 3: 299–310 (May), 1928. Abstr. A. L. Dopmeyer.

Contribution to the Knowledge of Sewage Chlorination—A study has been made of the effect of chlorination on the subsequent biological purification of sewage at a small suburban sewage disposal plant at Nürnberg. This consists of septic tanks and a percolating filter, and recently, owing to an increase in population, it has been considerably overloaded. In order to avoid extending the plant, which will shortly be superseded by a larger central works, a chlorinator was introduced before the percolating filter. The dose applied varied from 15 to 25 p.p.m. The effect of chlorination was to remove the odors, prevent the clogging of the filter and reduce the septicity of the final effluent. The oxygen demand of the filter influent was reduced by 14.3 per cent. The biological purification effected by the percolating filter, as measured by the reduction in permanganate and biochemical oxygen demand, was not, however, increased by chlorination.—E. Merkel, Paper read before Verein deutscher Chemiker, *Chem. Ztg.*, 52: 451, 1928. (From papers of Water Pollution Research Board, England.)

Chlorinated Copperas—A New Coagulant—Elizabeth City, N. C., takes water from Knobb's Creek and is facing the problem of reducing the color from 150 to 550 p.p.m. in the raw water to 7 to 10 p.p.m. as delivered to

consumers. The color is present as negatively charged colloidal particles as determined by dialysis and cataphoresis. A modern rapid sand filtration plant was ineffective.

Summary and conclusions: (1) Copperas (ferrous sulphate) and lime are not satisfactory coagulants at Elizabeth City, N. C., unless the copperas is oxidized to its ferric state; (2) prechlorination with reasonable doses does not improve coagulation of the highly colored water at Elizabeth City, N. C., when applied in the mixing chamber; (3) prechlorination reduces the tendency of the sludge in the coagulation basins to ferment; (4) single coagulation with any of the coagulants employed is not satisfactory because of the color and residual coagulant left in the filter effluent; (5) to produce an acceptable filter effluent "split" application of coagulants is essential. The primary coagulation must take place between pH 4.2 and 4.7, and the secondary coagulation between pH 5.5 and 6.5; (6) copperas, completely oxidized with chlorine in the ratio of one part of chlorine to 7.8 parts copperas, produces a coagulant superior to alum in color removal qualities and is more economical because of its higher efficiency; (7) a combination of chlorinated copperas, alum and lime or sodium aluminate produces an attractive and economical filtered water as evidenced by comments of consumers and cost data; (8) conversion of ferrous sulphate (copperas) to the ferric state is readily accomplished by introducing chlorine water from a chlorinator into the discharge line from the copperas feeding machine or solution tank. The reaction between the copperas and the chlorine is practically instantaneous, requiring less than 20 feet of travel for completion.—L. L. Hedgepeth and N. C. and William C. Olsen, *J. Am. Water Works Assn.*, 20, 4: 467–472 (Oct.), 1928. Abstr. C. G. Gillespie.

Iodine in Drinking Waters—In England no such correlation was found between presence of goiter and low iodine content of drinking water as has been reported in Switzerland and the United States. The loss of iodine due to filtration at Aberdeen and Edinburgh was insignificant, but a 50 per cent loss was found in Canterbury water after softening with lime. The mineral waters from Harrogate and Cheltenham have a much higher iodine content than ordinary drinking waters, which may partly account for their medicinal value. The authors caution against two possible sources of error in the determination of iodine in the case of (a) hard waters, and (b) acid mineral waters.—J. B. Orr, W. Godden and J. M. Dundas, *J. Hyg.*, 27, 2: 197–199 (Jan.), 1928. Abstr. A. W. Fuchs.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Legislation in Various Countries Regarding Silicosis with Special Reference to Compensation—The author summarizes the legislation and compensation provisions regarding silicosis in Great Britain for the refractories, metal-grinding and other silicosis industries through the scheme which became operative on February 1, 1929. It is the most comprehensive that has yet been considered and applies to:

> (a) All processes in which dust may be created in mining, or quarrying, or any other form of the manipulation of quartz, quartzite, ganister, sandstone, grit-stone, and chert; but it does not apply to any rock containing less than 50 per cent free silica; (b) Foundries and metal works in processes in which dust arises from (i) articles containing not less than 80 per cent total silica, (ii) fettling steel castings, and (iii) sandblasting with sand, crushed silica rock or flint; (c) Potteries in processes which incur exposure to dust from flint or quartzose sand; (d) Tin mines in processes which incur exposure to dust from the ore or ore containing rock.

The discussion concerns legislation in: the Union of South Africa, with broad provisions; Australia and its component states, New South Wales, Victoria, and Tasmania, in the latter two of which no compensation is granted for silicosis; Ontario, the only Canadian province with legislation definitely naming silicosis (its compensation is somewhat similar to the South African scheme); Alberta, whose Compensation Act of 1925 recognizes miners' phthisis as an industrial disease; British Columbia with a broad act (1925) which does not exclude occupational diseases from compensation, but does not refer definitely either to miners' phthisis or to silicosis; and Nova Scotia of which the same is true.

In the United States, silicosis is not directly named in any law allowing compensation, but the tendency

> . . . is for the language of the laws to be sufficiently broad to cover occupational diseases generally and to allow an interpretation including silicosis. Probably indeed awards for compensation have been made for silicosis as an occupational disease without being named as such in the law of the award, as for example in Wisconsin for irritant dusts.

For federal employees the wording used probably allows an interpretation including silicosis. Silicosis is apparently compensable in the broad acts of California, Connecticut, and Wisconsin. Occupational diseases, including silicosis, are also required to be reported in Maine, Maryland, New Hampshire, New York, Ohio, Porto Rico, and Rhode Island. In Minnesota and New Jersey physicians are called upon to report only diseases included in a definite list which does not include silicosis. No other countries have legislation with regard to compensation for silicosis. (A discussion of 10 pages follows.)—E.-L. Collis, *Rapports,* Apr., 1929, pp. 133–159.

Notes on a Fine Type of Fibrous Pneumonokoniosis Produced by Silicates and Other Minerals—Author's Summary—The etiology is discussed of the fine fibrosis of the lungs which is not uncommonly found in metalliferous and coal miners and some workers in other industrial activities in New South Wales. It is considered that this fine type of fibrosis can in most cases reasonably be assumed to be caused by various silicates. The term " silicatosis " is suggested for the fine fibrosis caused by silicates and the term " sili-

conosis" for a fibrous pneumonokoniosis of a mixed type. The type of fibrosis is considered in workers exposed to orthoclase basalt, coal miners, copper miners, and miners in Broken Hill, Western Australia and Tasmania; iron miners, asbestos and cement workers. The compensation laws of New South Wales relating to pneumonokoniosis are summarized and it is concluded that all fibrous pneumonokoniosis not due to dust containing over 70 per cent of quartz should come under the Workers' Compensation Act, 1926; and the Workers' Compensation (Silicosis) Act, 1920, which provides compensation for diseases caused by silica dust, should apply only to workers who are exposed to dust containing over 70 per cent of quartz.—Charles Badham, *Rep. Director-General of Pub. Health,* New South Wales, for the Year ended December 31, 1927, Section I-E, Industrial Hygiene, Serial Study No. 13, pp. 102–110.

Dust Sampling in Sydney Sandstone Industries—The Greenburg-Smith impinger used in gravimetric sampling was shown to agree with that determined by calculation if the particles are regarded as spheres. The average dust exposure of men using axial water feed drills in tunnels with varying degrees of ventilation has been determined at 110 particles per c.c. In the case of Sydney sandstone masons, the average dust concentration was equivalent to 420 particles per c.c. The Dust Standards of South Africa and Broken Hill (N. S. W.) require not more than 200 particles of less than 10 μ per c.c. of sandstone dust. Counting by the Owens' jet dust apparatus and by the Greenburg-Smith impinger shows both unrivalled for efficiency and ease of manipulation.—Charles Badham, H. E. G. Rayner and H. D. Broose, *Rep. Director-General Pub. Health,* New South Wales, for the Year ended December 31, 1927, Section I-E, Industrial Hygiene, Serial Study 12.

Silicosis among Sandstone Workers—Much fuller and more precise information than had already been obtained was desired about quarrying and stonemasons' work. The areas investigated were 9 in number, scattered from Glasgow to Bristol. Actually, 454 clinical examinations were made, with 266 radiographical examinations. The workers constituted 14 occupational groups and a precise method of securing particulars was followed in each case. A total of 171 *masons* was examined, of whom 116 were X-rayed and 57 found to be suffering from silicosis. Of 65 *rock-getters,* 33 were X-rayed and 13 showed silicosis. Out of 115 *quarrymen,* 67 were X-rayed and 33 showed silicosis. Similarly, 39 *planers* were examined, 23 X-rayed and 5 showed silicosis. The other occupational groups showed much less silicosis.

Of 112 positive cases found, 90 were in the first stage, 21 in the second and 1 in the third (corresponding respectively to the "ante-primary," "primary," and "secondary" terms used in South Africa). Only 1 definite open case of tuberculosis was found, but the inquiries were limited to those who were actually at work, thus preventing a determination of the total amount of tuberculosis present.

The vast majority of workers had been employed on so many different kinds of stone that it was impossible to differentiate effects. (No petrographic or chemical analyses of the stones are given.) Descriptions of 36 different cases are given. Silicosis appeared to become more common after 40 years of age and after 20 years of exposure in the stone industry. (Detailed tables accompany.)—C. L. Sutherland and S. Bryson, *Report on the Occurrence of*

Silicosis among Sandstone Workers. Medical Board under the Refractories Industries (Silicosis) Scheme, H. M. Stationery Office, Adastral House, Kingsway, London, W. C. 2, 1929, 41 pp.

Silicosis in the Pottery Industry—The history of the subject leading up to special powers for dealing with silicosis, the evidences of silicosis in the pottery industry, an outline of the two existing schemes, and proposals for a new scheme are taken up in Part I of this report. It is recommended that the scheme apply to any process in the milling of flint for use in potteries, all processes in the manufacture of potteries and in polishing, grinding and tile-slabbing. However, it is recommended that engine men and stokers and their assistants and workmen employed in modelling and mouldmaking, where carried on in separate rooms, might be excluded. The employers preferred that each employer be made personally responsible for liability in respect of the workers he employs. Both partial and complete compensation are provided for and the provisions of the scheme already in force for compensation in the metal grinding industries (1927) are recommended.

The committee strongly recommends that a special medical board for silicosis cases be set up. "The reasons why the committee prefer the employment in silicosis cases of a medical board rather than a single medical practitioner are fully discussed in their first report. Stated briefly, they are that it is only by a board constituted as indicated, that really satisfactory results can be obtained. The diagnosis of silicosis still presents such difficulties that it is undesirable to leave it to a single officer nor is it fair to the officer to impose on him such a heavy responsibility. Further, it is only by means of a board that uniformity and continuity of practice can really be secured."

Part II consists of detailed regulations for the prevention of silicosis. An appendix includes the report of conferences between medical members of the committee and the medical advisers of the employers and operatives, including some criticism, the questions of diagnosis, radiographic examinations, interpretation of films, classification of the disease, medical examinations and the processes to be included in the scheme. —*Report of the Departmental Committee on Compensation for Silicosis Dealing with the Pottery Industry.* Workmen's Compensation (Silicosis) Committee, Home Office, Great Britain, H. M. Stationery Office, Adastral House, Kingsway, London, W. C. 2, 1928, 41 pp.

The Diagnosis of Silicosis as an Occupational Disease—The paper deals solely with silicosis as it appears in the Gold Mines of Witwatersrand. The criteria adopted by the Miners' Phthisis Medical Bureau have been reached by a careful correlation of the results of pathological, radiographical, and clinical examination in a large series of individual cases. "Silicosis" or "miners' phthisis" as met here is the product of two factors: dust and tuberculosis. The silicotic process precedes and is essentially a progressive lymphatic fibrosis which begins at many points and develops very gradually. The degree or stage of a simple silicosis may be described in terms of the number and size of nodules which are present. In the majority of cases of apparently simple silicosis there is an early element of latent tuberculous infection with certain of the silicotic lesions. While acute infections may be present in the silicotic lung in an unmodified form, chronic infections tend to undergo modification by the production of a

massive infective fibrosis (tuberculosilicosis).

A change of type in the cases of silicosis has occurred in the Witwatersrand, accompanying the measures taken for the reduction of dust in mine air—pathological evidences point to the early presence in the majority of cases of an element of latent tuberculous infection. In fact, the onset of a tuberculous infection may sometimes bring to light latent silicosis. The legal definitions of the stages of silicosis in the Act of 1925 of the Union of South Africa cover the *ante-primary stage,* the *primary stage,* and the *secondary stage* (definitions given). Furthermore, tuberculosis means tuberculosis of the lungs or of the respiratory organs, and a person is deemed to be suffering from the same whenever the Bureau finds either (a) "that such person is expectorating the tubercle bacillus"; or (b) "that such person has closed tuberculosis to such a degree as seriously to impair his working capacity, and render prohibition of his working underground advisable in the interests of his health."

Regarding the monetary aspect, cases in the two earlier stages received "lump sum" awards averaging about £400 for the ante-primary stage, with an additional 50 per cent for the primary stage. Cases in the secondary stage, if resident in South Africa, receive a life pension, with additional allowances for dependents; the average inclusive payment is a little over £200 per annum. Allowances are paid to dependents in case of the miner's death. One important restriction is imposed. If a miner who has been notified that he has silicosis elects to continue work underground for more than 3 months, he forfeits all awards other than that to which he became entitled when first notified. But if eventually he dies from a cause to which silicosis is contributory, his dependents receive their prescribed allowances. The total disbursements for all classes of cases have amounted during the past 3 years to approximately *£1,000,000* per annum.

The clinical and radiographic diagnosis of silicosis is illustrated by a series of 22 radiographs representative of different pulmonary fibroses. A characteristic feature of silicosis in the lungs is that it is a generalized condition. The most reliable single diagnostic criterion is the radiograph, provided that this is of high technical quality and is taken instantaneously, but it must be supplemented by an expert clinical examination. The decision in cases such as silicosis should rest with a specially selected body of medical examiners who have wide experience of the disease, clinical, radiographic and pathological (nine pages of discussion follow).—L.-G. Irvine, *Rapports* (see above), pp. 43–91 (Apr.), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Antigenic Properties of Evaporated Milk—This study was made in an effort to find a more desirable substitute for mother's milk as a food for infants who display food allergy due to sensitization to cow's milk. This investigation is based on the theory that heating certain proteins so changes them that new antigens are formed.

Sensitization tests on guinea pigs and immunization studies in rabbits were made using raw, pasteurized, and evaporated milks. It was found that the milks yielded caseins nearly alike in regard to the minimum quantities of this protein required to produce fatal anaphylactic shock in guinea pigs sensitized to the three types of milk. However, large differences were found when the proteins from whey were compared. The minimum amount of whey proteins from evaporated milk required to produce fatal anaphylactic shock in guinea pigs sensitized to raw milk was 30 times greater than the minimum of whey proteins from raw milk, and it was 40 times greater than that from pasteurized milk in guinea pigs sensitized to pasteurized milk.

The precipitin and complement fixation reactions showed that casein from evaporated milk is very similar to that from pasteurized milk in antigenic activity. There were marked differences in the antigenic properties of the whey protein from the two types of milk. Five times as great a quantity of pasteurized whey protein as of evaporated whey protein was required to produce a precipitate in the presence of serums from rabbits immunized to evaporated milk, whereas when serums from rabbits immunized to pasteurized milk were tested, it was found that approximately 25 times as much evaporated whey protein as pasteurized whey protein was required to produce a precipitate. Approximately the same difference in antigenic properties of the whey proteins from the two types of milk was shown in the complement fixation tests. This indicates a change of specificity whereby heated whey proteins are less reactive in animals sensitized with raw or pasteurized milk, or with antibodies against pasteurized milk.—Oran I. Cutler, *J. A. M. A.*, 92: 964 (Mar. 23), 1929.

Unsuccessful Attempt to Produce Salmonella Intoxication in Man—In order to obtain human experimental data on the problem of whether or not thermostabile toxins, capable of causing illness in the absence of living organisms, are formed by *S. aertrycke* or *S. enteriditis*, 24 people ranging in age from 20 to 40 years were fed heat-killed cultures, or filtrates of cultures, of these two members of the Salmonella group. The 9 strains used had been isolated from food poisoning outbreaks. The heat treatment of the cultures consisted of boiling for 20 minutes in a water bath, and the filtrates were obtained by passing a portion of the culture through a Mandler filter. The cultures used were obtained by incubation for periods varying from 6 hours to 20 days. All the strains used were toxic when injected intravenously into rabbits. The subjects were all fed on an empty stomach, receiving only the culture or the filtrate with a small amount of water. In no case was there vomiting, headache or diarrhea, and there

was no change in blood titer against homologous strains 10 days after feeding. None of the persons fed noted any subjective symptoms.—G. M. Dack, W. E. Cary and P. H. Harman, *J. Prev. Med.*, 2: 479 (Nov.), 1929.

Indian Ephedras, Their Extraction and Assay—Many species of *Ephedra* are known. The Chinese species have been reported to contain from 0.018 per cent to 1.32 per cent of total alkaloids. The American species contain none. This study embraces *E. Gerardiana, E. intermedia,* and *E. foliata*. The first of these contains from 0.4 to 1.25 per cent of alkaloids, the second from 0.1 to 0.3 per cent and the third none. The altitude at which the plants are grown has no effect on the alkaloidal content, but the rainfall exerts a distinct influence; the greater the rainfall, the smaller is the content of alkaloids. The method of extraction employed consists in cold maceration of the finely powdered drug with a mixture of ether (3) and chloroform (1) rendered strongly alkaline with ammonia. This process eliminates the red coloring matter which is present in the stems of the Indian Ephedras and which is extracted by cold alcohol. The liquid is decanted through a filter and the residue treated twice more with fresh solvent. The combined extracts are distilled and the residue is extracted with 1.5 per cent hydrochloric acid until the alkaloids are removed. The combined acid extracts are filtered, made strongly alkaline with potassium carbonate, and the solution almost saturated with sodium chloride. The mixture is shaken 4 times with ether, the bulk of the ether distilled and the residue allowed to evaporate spontaneously. An excess of 0.1 *N*-hydrochloric acid is added and the excess titrated with 0.1 *N*-sodium hydroxide, using methyl orange as indicator.

For large scale extraction of ephedrine, the method found most suitable was extraction of the finely powdered drug with 5 times its weight of cold 0.5 per cent hydrochloric acid. The acid treatment was repeated twice. The mixed acid extract was filtered and neutralized with sodium carbonate till just neutral to Congo, but acidic to litmus. After concentration on the water bath, the solution was made strongly alkaline with sodium carbonate, the precipitate separated and washed with little water, the washings being added to the filtrate. To the filtrate, which contained most of the alkaloids, a large excess of sodium chloride was added and the solution extracted 4 times with ether. The solvent was removed by distillation and the alkaloid residue converted into the hydrochloride by neutralizing with hydrochloric acid. After concentration at 45 to 50° the hydrochlorides crystallized. After drying, the residue was treated with dry chloroform to dissolve the hydrochlorides of other bases, leaving pure ephedrine hydrochloride. A further quantity of ephedrine was recovered from the precipitate, previously removed, by boiling with benzene.—S. Krishna and T. P. Ghose, *Trans. J. Soc. Chem. Ind.*, 48: 67 (Mar. 22), 1929.

Some Comparisons of the Nutritive Value of Whole Wheat Bread and White Bread—White bread and whole wheat bread were compared in this experiment, using albino rats as test animals, to demonstrate their relative nutritive values when they were used as the sole sources of (1) vitamin B complex (F and G), (2) protein, and (3) minerals. It was found that in diets supplemented in respect to other nutrient factors respectively, whole wheat bread was superior to white bread as a source (1) of vitamin G, (2) of protein, and (3) of minerals. Although these experiments have shown the superiority of whole wheat bread

over white bread, it is unnecessary to be concerned over the deficiencies of white bread and discredit its value in the diet, nor is it necessary to advocate the use of whole wheat bread. The dietary habits of the American people are such that any deficiencies of one food item, such as bread, may be amply supplemented by other foods—eggs, dairy products, and vegetables. But where bread constitutes an unduly large proportion of the diet, then the deficiencies of white bread may lead to malnutrition, which could have been prevented by the use of whole wheat bread.—S. M. Hauge and Aneta P. Beadle, *J. Home Econ.*, 21: 199 (Mar.), 1929.

The Mineral Content of Grain—This article is a summation of whole grain analyses made over a 10-year period at the Utah Experiment Station. Figures given are based on analyses of 1,775 samples of wheat, 1,205 samples of oats, 110 samples of barley, and 75 samples of corn. These grains were grown: on both irrigated farms and dry farms; on soils varying widely in composition in respect to "alkali," calcium, sulphur, and gypsum. Determinations were made of ash, calcium, magnesium, potassium, phosphorus, sulphur and iron. The maximum, average and minimum percentages of each of these determinations for each grain are set forth in tables. In general, the figures reported for Utah-grown grains are higher than those previously reported by other workers on grains from other sources. The authors attribute this to the composition of the soil and of the irrigation waters. Using the wheat analyses as a crude measure, the authors estimated the effect of irrigation, soil and variety on the mineral content. For ash, they estimated the extreme variations due to irrigation water to be 46 per cent, variety 31 per cent, and soil 118 per cent. Wheat showed the widest variations and oats the highest average content. Soil, irrigation water and variety caused 600 per cent, 260 per cent, and 200 per cent variations respectively in wheat. Less variation was found in the magnesium content, as irrigation produced 32 per cent and variety 25 per cent. Potassium was found to vary 51 per cent, 35 per cent, and 28 per cent respectively, due to variety, irrigation water and soil. The extreme variation of phosphorus content of wheat was over 300 per cent. Variation in phosphorus content was due to irrigation, soil, and variety. The Utah-grown grains showed a lower phosphorus-calcium ratio which the authors claim make such grains a more nearly balanced food. The sulphur content variations were found to be 48 per cent, 40 per cent, and 30 per cent respectively, due to irrigation water, variety and soil. Sulphur determinations were made by the moist-fusion method, which gives higher results than by ashing. The iron content variation was found to be markedly affected by irrigation water, variety and soil. The authors raise the question whether the factors they report would not materially modify the nutritive value of grains grown on such highly fertile calcareous soils.—J. E. Greaves and C. T. Hirst, *J. Nutrition*, 1: 293 (Mar.), 1929.

The Effect of the Cow's Ration on the Vitamin "D" Content of Milk—As a step in the study of the effect of the cow's ration on the food value of milk, the vitamin D or antirachitic potency of milk from cows on the high-and-low-protein experiment was determined. Since the vitamin C content of feeds used in grain mixtures is negligible, and since all the cows in the experiments received silage, the difference in the vitamin content of the milk was probably due to the kinds of hay used. The high protein and normal cows received alfalfa hay. The low protein cows received timothy hay. The low protein cows also received 1.5 lbs. of

molasses daily. It is concluded that milk from cows fed on a low protein ration that contained timothy hay was slightly more potent in vitamin D than milk from cows fed a high protein ration containing alfalfa hay. Whether this difference was due to the kind of roughage, the manner in which it was gathered and handled to the stage of maturity at which it was cut, or to the presence of molasses in the low protein ration, remains to be determined. The results obtained also indicate that cow's milk is a relatively poor source of the antirachitic factor, at least 23 c.c. of milk (0.8 gm. of butterfat) being required to allow practically normal bone formation in rats fed on a rickets producing basal ration.—W. E. Krauss, *Ohio Agri. Exper. Sta. Bull.*, 14: 57 (Mar.–Apr.), 1929.

The Relation of Soil Fertility to Vitamin "A" Content of Leaf Lettuce—The results reported herein bear upon the question of whether the vitamin A content of plant tissue varies with the conditions of soil nutrition which determine plant development with respect to size and robustness. Lettuce was grown on normal sandy loam soil, on this soil with added sheep manure and a mixture of KNO_3, $CaH_2(PO_4)$ and KCl, and on the same soil with the inorganic fertilizer without the organic manure. This latter lot grew most profusely and with the greatest vigor. Furthermore, the lettuce grown with the inorganic fertilizer only was the greenest of the three lots. Rats were depleted of their store of vitamin A, and when definite losses of fat or xerophthalmia occurred, the rats were fed daily 0.2 gm. of lettuce grown on each type of soil. The animals fed on lettuce raised on the soil treated only with the inorganic fertilizer grew at the most rapid rate and made the greatest gain during the experimental period of 8 weeks. The growth curve for the rats fed lettuce grown with inorganic and organic fertilizer was always below that of the rats fed lettuce grown with inorganic fertilizer only. The rats fed lettuce grown on soil without fertilizer grew more slowly than those in the other two groups. Differences in the growth of the animals on the three grades of lettuce are not explainable through variation in the relative quantities of the chemical elements present. It is concluded that vitamin A content varied with plant vigor and robustness. The variations in vitamin A content of the plants were likewise associated with the degrees of greenness, and not necessarily with vigor apart from differences in chlorophyll.—Marie Dye and John W. Crist, *J. Nutrition*, 1: 335 (Mar.), 1929.

Manganese in Cereals and Cereal Mill Products—The object of the work reported was to study the variation in the manganese content of cereals of several varieties and of some of their extraction products in relation to ash and protein content. Five varieties of each of the cereals were used as follows: hard winter wheat, soft winter wheat, red spring wheat, white spring wheat, rye, corn, rice, oats, and barley. Similar determinations were made on some of their extraction products. No correlation was found between manganese and the ash content of any of the varieties examined. Neither was there any correlation found between manganese and protein except when the types of wheat were used collectively. In that case, the relation was inverse, the hard winter and the red spring wheats being higher in protein and lower in manganese than the two types of soft wheat.

It is of interest to note that the manganese content of Red Rustproof oats grown in Arlington, at the Experimental Farm of the Department of Agriculture, was found to be several

times higher than that of other varieties of oats studied.

No distinct correlation was established between the manganese content and the protein content of the cereal products, with the exception of the milling products of wheat. The products having a low ash content had a low manganese content, both being due to the low degrees of extraction. A comparison of the manganese content with the diastatic properties of the cereals used in this investigation failed to show any correlation between them. The author further observes that corn and uncoated rice, which are associated with nutritional deficiency diseases, were both low in manganese.—Jehiel Davidson, *Cereal Chem.,* VI: 128 (Mar.), 1929.

The Phosphorus of Grains—It has been shown that the phosphorus content of wheat, oats, and barley is increased as irrigation water is applied. In order to throw some light on whether the increase represents organic or inorganic phosphorus, quantitative determinations have been carried out of the total and inorganic phosphorus. Determinations made on wheat, oats, and barley, in which increasing applications of irrigation water were applied during the growing stage, showed relative increases of total phosphorus. Wheat showed a maximum total phosphorus increase when 35 inches of irrigation water was used. At 67.5 inches, a decrease was observed. Practically all of the increase is in the form of organic phosphorus. Corn showed little increase when irrigation was applied. The increase observed in corn was in the form of inorganic phosphorus. The increase of inorganic phosphorus in corn was shown to be due to the use of varying amounts of farm manure. Samples of grain collected from various sections of the State of Utah, where this work was done, showed a wide variation in the phosphorus content. It was concluded that irrigation, soil, and possibly climatic conditions, all influence the total phosphorus content. It was further concluded that there was no direct relation between the total and inorganic content of the grains studied. The average inorganic phosphorus as compared to total phosphorus in wheat was 6.5 per cent, in oats 9.8 per cent, and in barley 9.6 per cent.—J. E. Greaves and C. T. Hirst, *Cereal Chem.,* 6: 115 (Mar.), 1929.

Chemical Composition of Mustard and Turnip Greens and Losses of Iron in Cooking—Data are presented on the chemical composition, including ash, calcium, phosphorus, and iron, of turnip greens, mustard greens, and spinach, and on the losses of iron in cooking turnip and mustard greens in various ways. The method used for the iron determinations was moist oxidation followed by calorimetric estimation with thiocyanate, the technic including certain modifications of variations in the method reported in the literature. A comparison of the data for turnip and mustard greens with similar data for spinach showed that both vegetables compared favorably with spinach in all respects and were markedly higher in calcium and iron. When cooked in varying quantities of distilled water for 45 minutes, the losses in iron varied from 5 to 25 per cent, depending upon the volume of water used. Tap water (the city supply of Nashville, Tenn.) caused more than twice as great a loss of iron as was caused by an equal volume of distilled water.—A. M. Field, M. T. Peacock, E. Cox, and I. P. Earle, *West. Hosp. & Nurses' Rev.,* 11, 5: 26–28, 1928. Abstr. *Exper. Sta. Rec.,* 60: 190 (Feb.), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

PHYSICAL DEFECTS

LEROY A. WILKES, M. D., FELLOW A. P. H. A.

Director, Division of Medical Service, American Child Health Association, New York, N. Y.

WHEN is departure from absolutely normal structure or function a real "physical defect," and what are the signs or symptoms by which such defects may be recognized and properly referred to the most helpful professional person for advice and treatment? The answer to this question is not so simple as it might at first appear to be. Physical defects are not merely anatomical variations, but often are intimately related to function, and at times vary in degree with environmental conditions. Physical defects are of two major types:

a. Those which are dynamic in character and produce demonstrable effects in a short time

b. Those which might be regarded as potential "threats" to an individual's health or longevity

Much of the disagreement in professional advice between physicians is centered on these potential "threats" rather than on the dynamic type of defect. Also, a great deal of lost effort, time and money are closely associated with "follow-up" on the part of the nurses to get these "threats" removed or corrected and to persuade reluctant parents to have something done for them, where the parent remains unconvinced of the value of the procedure being recommended. With a limited budget and personnel would it not be more economical and effective to concentrate upon the most urgent defects, merely notifying parents of the others, until the more urgent corrections have been made?

The greatest need in our efforts to restore and promote health, is more *facts* and less opinions on this subject. This necessitates the development of more instruments of precision, which, placed in the hands of easily trained technicians, will furnish data that are objective, reliable and valid. These data must then be handled in an accurate and sound statistical manner and the interpretation of the findings must be made by one who has sufficient background of training and experience, to determine best its real significance and the most effective methods of practical application.

Many records of "defects" today are worthless since many of these records represent only the opinion held at the time of examination, and by the individual examiner.

The opinion of the same examiner, on the same case, is in certain types of defects, such as tonsils, not always constant, and opinions of different examiners on the same case when independently formed, even after examinations made in the same hour, not infrequently differ markedly.

These statements are not intended as caustic criticisms of the examiner's individual ability, but a frank recognition of our present-day limitations. This fact most physicians unhesitatingly recognize. Some less competent au-

thorities still dogmatically declare their ability to differentiate and interpret the signs and symptoms of "abnormality" in many of the border-line cases in which physicians realize their present-day limitations. Anyone can detect extreme cases of defective structure and function, but for such advanced cases little can usually be done; therefore it is desirable to direct our efforts toward preventing defects and toward their early discovery and treatment because:

1. Physical defects tend usually to become worse.
2. Physical defects tend to produce secondary defects.
3. Physical defects tend in time to become irremediable.

What are the more commonly seen physical defects and how may they be detected in order to prevent them from doing the greatest harm to the individual?

Vision and Hearing—Under our modern conditions, especially in our crowded and bustling cities, we find in the younger children defects of vision and hearing. These are not infrequently directly related to disease, such as acute contagious diseases of childhood, local infections, and general infections of the blood and lymph—syphilis and tuberculosis.

Tonsils and Adenoids—Infections of the adenoid tissue of the nose and throat are not always easy to detect in the earliest stages, and there the germs frequently remain latent in the tissues and establish laboratories whose products may sooner or later become absorbed into the blood and insidiously attack other distant parts of the body, at times when resistance is lowered by such agencies as cold, fatigue, undernourishment, and so forth. Not only do the nose and throat offer all the favorable conditions for bacterial growth (warmth, moisture, darkness, and "food"), but the engorgement of the erectile tissue of the nares obstructs breathing; interferes with aeration and purification of the blood; and closes the natural draining passages for the constantly secreted mucus of the pharynx.

This mucus, under such circumstances, is often dammed back into the Eustachian tube and produces abscess of the ear, with impairment of hearing; and also makes possible mastoid infection and meningitis as secondary effects. These complications can in many cases be avoided by early treatment of the original nose or throat infection.

Glandular Enlargements—Enlargement of the glands of the neck may be either a physiological defense against, or the direct result of, disease. This differentiation can only be determined after a careful study of the individual case by a competent physician. The thyroid gland is often enlarged as a result of simple iodine deficiency. The thymus gland, which ceases to function ordinarily in early life, occasionally persists later than usual and causes some difficulty. The lymph glands of the neck filter out poisons elaborated at points of local infection and thereby aid in preventing "blood-poisoning" or general infection. The treatment in such cases is directed to the source of infection rather than to the glands themselves, though the glands may in some cases require attention.

Skin—The skin has many different types of disease which attack it in various individuals. Local conditions often require general treatment as well as local applications and these diseases may be contagious or not. The distinction should be determined early, both for the sake of the patient and of those with whom he may come in contact. Before destroying the characteristic appearance of the lesions, by ill-advised efforts at home treatment, it is advisable to consult the physician early, so that he may see the evidence uncomplicated by such efforts. Time and money are usually saved by this plan.

Teeth—The prevention of dental caries is an urgent problem and one which we have not as yet fully solved. What relation does this condition bear to tooth brushing, diet, mouth acidity, bacterial action, proper mastication, pits and fissures, poor occlusion, heredity, or to mineral deficiency of the blood stream and the many other suggested causes? I feel that we are far from agreed at this time upon this point. It seems quite evident that filling of the cavities retards the process of dental decay, and surely clean teeth do improve one's appearance. It appears to be justifiable to clean the teeth regularly and to have cavities filled by the dentist.

Dental caries has been described by Sir William Osler as "our most prevalent disease," and statistics amply confirm this statement. Further research is greatly needed upon this subject.

Lungs—Lung conditions or diseases are most usually centered about tuberculosis and the pneumonias. These conditions can often be diagnosed early by the physician only after the most careful individual examination with laboratory and X-ray aids. Such examinations require skill and a private, quiet place for the examination.

Heart—Defects and diseases of the heart restrict the activities of the individual in varying degrees. These restrictions can only be determined by careful study and experimentation by the patient and his physician. Each person appears to have his individual circle of permitted activity, even in health, but especially in heart afflictions.

Cardiac cases in school children in many instances are benefitted by special class programs arranged by the teacher and doctor in coöperation. Shorter hours, no stair climbing, avoidance of crowds, and, above all else, frequent reëxaminations and supervision by the doctor are essential.

Bones—Infections of the bones and joints require expert study and diagnosis before treatment can be considered. Efforts not preceded by, and founded upon, a careful medical examination are ill advised.

Orthopedic Cases—There is grave danger in many of the efforts made to conduct "corrective gymnastic" classes where no careful medical examination and treatment outline has been given by an orthopedic physician. Most deformities, such as flat-feet, bowlegs, etc., involve muscle, ligaments, and nerves as well as the bones, and the coördinating mechanism is complicated and not easily understood or appreciated.

Nervous Diseases—Diseases of the nervous system must be carefully distinguished from the emotional lack of control which is so often called "nervousness" and which is seen in the so-called spoiled child, or, as many now refer to it, the unadjusted child. Many of these children appear to respond rapidly to the adjustment of the parent, or of the individual having charge of the child. Emotionally unstable and untrained nurse-maids are at times big factors in these cases.

Cripples—In considering the crippled child we have usually to deal with a combination of defects of the muscular, bony and nervous systems, and in a certain percentage of these cases the mentality is also affected by the underlying causative factor or factors.

The major school problems in cases of crippled children where the mentality is not involved are as follows:

1. The determination as to whether the disease is of a "progressive" nature or is "arrested"
2. The problem of transportation to and from the school
3. The problem of providing the greatest comfort to the child while in the school, in order to conserve his lowered vitality, so he may use it most profitably. (Special furniture is usually required for bad deformities.)

Malnutrition—Here is a much discussed and often abused subject. It is an arbitrary and inclusive term rather than a definite entity and, therefore, must be clearly defined by each one who discusses this subject. Too often the food aspect alone is considered. There are other factors of equal importance to be considered, such as the transportation of the food through the digestive tract and the absorption and assimilation of food, which takes place at various points along the way. Then there is the important function of waste elimination.

All of the bodily processes are affected in varying degree by the emotions and these are far from standardized in different persons. One should study carefully the factors involved and the part played by each. The digestive tube, of which the stomach is but a dilated portion, or storehouse, is composed, to the extent of three-fourths of its bulk, of muscle. This muscle along with other muscle suffers from bodily fatigue or weakness, and cannot in such a state push along the food in the digestive tube at the usual rate to the sites where the specialized digestive functions are located; and so the digestive process is thrown out of gear by the element of fatigue. This factor is an extremely important one in childhood and in adolescence. "Fashion" plays a large part in the adolescent age. Many of the cases of fainting and apparent ennui are due to weakness, which is in turn due to extreme dieting carried on in an ill-advised endeavor to attain the slender figure that, I am happy to be informed, is not to be "the mode" any longer.

Hernia—the escape of the gut through the body wall into a sac of tissues pushed ahead of it—usually occurs at special areas which are inherently weak from the time of birth. Hernia occurs directly as a result of increased intra-abdominal pressure, usually caused by muscular strain induced by heavy lifting or prolonged and strenuous coughing, such as occurs in the paroxysms of whooping cough.

The detection of physical defects in their early stages is distinctly a medical man's problem. There are devices now available, and we hope that more will become available in the near future, which will enable nurses, and others perhaps, to detect suspicious signs early, and send the child at this time to the physician for proper study, diagnosis and treatment. Among such helpful devices we might mention the thermometer, the eye-test charts, the audiometer and other hearing test devices, the scales and measuring devices. These devices and the physician's judgment are at present our final criterion, and will probably remain such, since the up-to-date physician always takes advantage of all improvements in instruments of precision which actually aid in the determination of facts upon which to base his opinion and treatment.

Treatment is wholly a problem within the domain of private and hospital medical practice.

Prevention of physical defects, in so far as our limited knowledge goes, is dependent upon nature and nurture. Healthy living is intimately concerned with:

1. Proper foods with regular elimination of waste
2. "Rest-exercise balance," which, of course, includes sleep
3. Cleanliness of body, mind and soul, which are closely correlated
4. Preservation of body against injury through "safety first" observances
5. Recreation of proper kind and amount for the individual
6. Periodic medical and dental examinations to detect latent "threats" or early involvements before they produce symptoms recognized by the patient
7. Early medical attention to suspicious signs of departure from the normal condition of the individual child—the so-called "droopy

stage," which the mother often detects more readily than the physician, because of her knowledge of the characteristic "normal" appearance and activities of the individual concerned

These suspicious signs include in the earliest stages nothing definitely definable because they are merely the absence of usual characteristic appearance and actions of the individual child. These indications are usually later followed by definite signs and symptoms, such as fever, rash, inflamed or watery eyes, sniffling or mouth breathing as before a cold, discomfort or even pain, diarrhea or constipation, earache, etc.

Of course, chronic eyestrain, squint or frequent headaches at the end of the day, defective hearing, or discharge from the ear, mouth breathing, or frequent sore throat or joint pains, poor nutrition, fatigue from which recovery is not rapid nor complete, shortness of breath, unusual swellings, "limp" or apparent deformity, decayed teeth, skin lesions, all suggest the need of medical attention.

Convalescence from the acute contagious diseases should be adequately prolonged to prevent complications such as those mentioned, and also improvement of heart, kidney, lung, bone, joint and nervous system.

SPECIFIC PREVENTIVE MEASURES

Eyes:

Proper lighting—avoidance of shadows or glare.

Occasional looking at distant objects to relieve the muscular contraction by which accommodation for near objects is obtained. Headaches often result from muscular spasm or "cramps" produced by prolonged close accommodation, particularly where lens defects exist.

Correction of certain visual errors by glasses, when these are suggested by squint, redness or frequent "watering" of the eye, headaches or blurring of the image, and the oculist discovers defects.

Ears:

Ear conditions are commonly secondary to nose and throat troubles, such as nasal obstruction or infections, especially following the acute contagious diseases, commonly involving the accessory sinuses, but may occasionally come independently.

Malnutrition:

Proper quantity and quality of food (selection, combination, preparation, digestion and assimilation).

Correction of interfering physical defects; discovery and elimination of foci of infection; and the avoidance of fads and food cults or doctrines founded upon dangerous half-truths, which are often worse than untruths, and more difficult to combat.

Proper hygienic habits affecting the individual concerned.

Hernia:

Careful medical examination will aid in determining whether the usual sites for hernia are inherently weak in the individual case. Especial care should be exercised, when such conditions exist, to avoid undue physical strains which produce muscular contractions and raise intra-abdominal pressure. Special supports may be worn when indicated to lessen the danger of rupture.

Bony Deformities:

These are sometimes due to faulty diet. In such cases the diet can be corrected before the deformities appear, as in rickets. "Safety-first" is always a good rule to follow, and many needless hazards can be eliminated by protective devices in sports and industry.

Physical defects can be minimized by ordinary care and the practice of the habits of right living. Periodic health examination by a physician is the best safeguard to health.

"Have a Health Examination on your Birthday."

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Purposeful Publicity—Appraisal forms of one kind or another are finding their way into many organizations. Self-analysis is increasing in popularity, and is the "tape measure of utility" these days. The Community Health Association of Boston chose a play as the medium of appraising its own family health work, and presented it to interested audiences as a method of publicity.

The Clark family was one which the Community Health workers had actually visited over a period of more than 2 years. A flimsy excuse brought the nurse on the first occasion, but the so-called unnecessary or unsatisfactory visit led to much greater consequences.

A series of ups and downs in the Clark family motivated the little drama with more than usual success. A new outlook on life, wholesome, nourishing food, and a way to live within their means, brought about an evolution from the border-line of disaster to a position of health and happiness. Just an ordinary family with the usual assets weighed against the usual liabilities—but, by means of wise guidance and thoughtful consideration, the realization of health teaching was grasped, and the Clarks became a "prize family." The play was given for the first time to the senior students of three large schools of nursing in Boston, to show them what good public health nursing is and how satisfactory it really can be, and to enlist their interest in it.

The second audience was composed of board members, theoretically well grounded in the work the nurses are doing in the homes. The play gave them an actual picture of the approach to the home, the kind of service given, and the result of repeated application of health teaching.

The third presentation was for the staff nurses, as a means of stimulating them to have faith in their efforts, by seeing the complete piece of health work of which they are only a part. So often a nurse remains in one locality too short a time to see tangible results of her efforts, or she becomes so lost in the details of the work that she loses sight of the breadth of her own accomplishments.

Twenty Aids to Mental Health for Adults—Go into any book shop these days and you will find arranged on the shelves, on the non-fiction side of the room, numerous volumes dealing with psychology for normal people. Many of these books will be read. Others could be read to advantage, but limited time and inclination are the decisive factors in the selection of reading material for the average individual.

Adults need mental health. Each one of us is vastly interested in his own mental status, but he may be absorbed in the problem from an entirely wrong standpoint, and for this reason may need wise guidance more than a person who is entirely unconscious that there is such a thing as mental health.

Dr. Henry B. Elkind, Director of the Massachusetts Society for Mental Hygiene, has prepared a leaflet, *Twenty Aids to Mental Health for Adults*, which is arresting because of its simplicity and brevity. Each short paragraph is packed with good sound prac-

tical advice—just the things which public health nurses need on so many occasions—and the whole is an appeal to common sense. Copies may be obtained from the Massachusetts Society for Mental Hygiene, 5 Joy Street, Boston, Mass.

The Dairy Counciler—The National Dairy Council, 307 Michigan Avenue, Chicago, Ill., is publishing in 6 issues annually a bulletin known as *The Dairy Counciler*. The first issue appeared in April, 1929.

Judging by the contents, the purpose of the bulletin is to keep organizations posted on the new material offered by the council. Practical suggestions for health programs and general information regarding the National Dairy Council are other features of the first number.

The League Celebrates a Birthday—The League of Red Cross Societies was 10 years old on May 5, 1929. To celebrate this event, a special League Anniversary number of the Red Cross Courier is devoted to the work and achievements of the League during the first decade of its existence.

Red Cross Work for War Veterans—The Red Cross has assumed two definite obligations, one of which is the service to the war-disabled veteran, and the other the preparation for disaster relief.

The magnitude of the former feature of Red Cross endeavor is impressed upon us, when we know that 56,500 cases were handled monthly during the fiscal year, which ended June 30, 1928.

Veterans are aided in the preparation and presentation of claims, and given temporary relief, if necessary, pending the judicial decision of the claim by the government.

A Rise in the Protein Stock Market—In an address before the New York Association of Dietitians, E. F. DuBois expressed the opinion that more attention will be paid to the dangers of partial protein starvation in chronic diseases. Many clinicians are still restricting the protein diet in nearly all patients supposed to have high blood pressure or nephritis, because the excretory organs are considered impaired and should not be overtaxed.

Today, there are instances in certain types of nephritis where good gains have followed a liberal protein intake. When patients have a heightened metabolism, it is easy to deplete the body in respect to protein, if the diet is poor in that foodstuff.—The Control of Protein in the Diet, Current Comment, *J. A. M. A.*, 91, 24: 1897 (Dec. 15), 1928.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

For Expositions and Fairs—Two much used—and still useful—stunts for county fair and exposition exhibits may yet be secured in mimeographed form from the Tuberculosis and Public Health Committee of the State Charities Aid Association, 105 East 22d Street, New York, N. Y. Copies of "Tommy Don't Care and Tommy Docare" or "Health Fortune Teller" will be sent for 10 cents each.

Shall We Pay for Radio Time?—A health officer writes:

I have a limited amount of money for publicity purposes and the question is whether to use it on a bulletin or use radio broadcasting. We have an excellent local radio station which has given us a very low rate for use each day, and I have almost come to the conclusion that this form of publicity would be of greater advantage to the public health work of this community.

One reply to this letter was:

It would be quite unusual for a department or other health agency to pay for radio time. If you pay for radio time the newspapers may well ask you to pay for all space they give you.

So it would seem better to spend your funds —you do not say how much—on a regular bulletin or house organ, or for the preparation of good copy for newspaper use. Either method would promise to cover your city more fully than could be possible by radio. If you issue a bulletin you would issue 6,000 to 8,000 to cover the city.

The two newspapers, with their combined daily circulation of 25,000 and over, would doubtless welcome your copy if it is put up as good as should be the case of radio talks. In connection with the newspapers you would spend your available funds for the part-time of some one to write the copy from material you would supply.

If you use the radio, I wonder if it would be worth while to try for time every day—it depends partly upon the length of each period, the hour, and especially upon your ability to produce material of enough attractiveness in subject and form to lead enough people every day to listen in—poorly done radio talks may do as much harm as good.

Texas Better Health Special—

For several years the Missouri Pacific Railroad has operated health cars in certain sections of Missouri and Arkansas, but the Texas Health Special was an entire train made up of two exhibit cars, two lecture cars, baggage car, diner and Pullman. Besides the train crew there was usually a personnel of 12 or 15 trained physicians, sanitary engineers and technicians. The railroad was invited by Governor Dan Moody and Dr. J. C. Anderson, State Health Officer, to bring the train to Texas. . . .

The first car contained models and exhibits pertaining to general sanitation most needed in the South, particular attention being given to models showing the proper kind of screens for houses, mosquito control work, models of fly-proof toilets, construction of wells, sewage disposal, garbage disposal, rodent control, etc. Then came a lecture car in which public lectures were given by specialists in the different departments of sanitation shown in the exhibits.

The next car was also a lecture car, in which general topics of disease prevention and safety were discussed and illustrated by charts, delineascopes and films. In the fourth car was a model of a complete dairy farm and a milk plant with a miniature pasteurizing plant in operation. . . .

The train traveled more than 2,500 miles and visited 115 towns and cities. Seventy thousand people were shown through the train and listened to the lectures.—

Hygeia, July, 1928.

EDUCATIONAL MATERIAL

"Announcing a New Service for Teachers" is an 8-page booklet concerning speakers, demonstrations, class-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

room helps, plays, and posters supplied by Dairymen's League Coöperative Association, 11 West 42d St., New York, N. Y. *Copy free.*

"First Aid for the Mentally Sick," by New York State Committee on Mental Hygiene, 105 East 22d St., New York, N. Y., describes "the provision made for the emergency care of mental patients"—the "wrong way" as is common in New York State and other states—and the "right way." *Free.*

"Health—Diseases, Drugs and Sanitation," list of United States Government publications now on sale. Revised. Superintendent of Documents, Washington, D. C. *Free.*

"How to Use a Good Refrigerator," by M. E. Pennington. National Association of Ice Industries, 163 West Washington St., Chicago, Ill. *Free.*

"Old Mother Hubbard and Her New Cupboard" contains 50 well written articles on "nutrition with special emphasis on the problem of child feeding." Good paper of a weight to give the pamphlet permanency. The 6-point type is small, but is helped out by the leading and good press work on good paper. Writing above the average, with a number of teasing titles: "Grown-Ups on the Milk Wagon," "He Eats Like a Man," "The Master Clock," "Fit for a King," "The Golden Egg," "Straight as an Arrow," etc. *It has a table of contents.* The articles, one to a page, run about 300 words, and were published weekly by 50 newspapers in Los Angeles County, Calif. Written by Rama V. Bennett, nutritionist of Los Angeles County Public Health Association, and issued jointly by the association and the County Department of Health. *Send 50 cents to the department for a copy.* Should be usable in other counties in other states. Copyrighted but doubtless permission to use would be granted.

"One out of every two workmen cannot see clearly what he is doing," a 5-page press release by L. H. Carris, National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y. For speakers and house organs. *Free.*

"Tuberculosis: The Maker of Orphans," including "Winning—But Not Won!"—Tuberculosis Society, Racine, Wis. *2 cents.*

The two following are from the Metropolitan Life Insurance Company, *1 Madison Ave., New York, N. Y.*: "Forethought the price of life," a 4-page folder on medical examinations; and "Health, Happiness and Long Life." 22 pages. Elements of health. Limited text.

Both the above have a little too much color and too much ornamental detail to encourage concentration.

The three following are from American Institute of Baking, Chicago (*Free*): "Answering Bread Criticisms," by Roscoe H. Shaw. 8 pp.; "The Bread of Life," by E. V. McCollum. 12 pp.; and "Facts About Bread."

DIPHTHERIA

The Metropolitan Life Insurance Company has prepared a diphtheria car card, a reproduction of the New York State prize winning poster. *Free.*

A 32-sheet billboard reproduction of the prize poster is sold by the State Charities Aid Association, 105 East 22d St., New York, N. Y. *50 cents.*

"What a *Whale* of a difference a little *Health* makes," Health Council, Electric Building, Cleveland, O.—a 4-page, 6″ by 9″ folder with distinctive illustrated cover page. Appeal to "be wise—immunize," and how "Cleveland Fights Diphtheria." *4 cents.*

Tabloids for diphtheria! That's the new prescription in the home city of the Schick test! Pardon the near-tab language, for the Diphtheria Prevention Commission of the New York City Department of Health has gone into tabloids in a big way. It started with

a 4-page tabloid newspaper for Brooklyn which centered around Boy Scout coöperation in the anti-diphtheria campaign. Then Bellevue-Yorkville's *Health News* evolved into true tabloid style which can be appreciated only when seen. Jean Henry is Tab Editor for the Commission, with Marjorie Dent Candee as Bellevue-Yorkville Editor. Harlem (negro) and Bowling Green editions have been issued by the Commission.

In strong contrast with the above is the altogether dignified 9″ by 6″ card for the doctor's office which has been mailed to all practicing physicians in the city.

The card is of heavy beveled board with the lettering in white on a soil-proof brown background and bears in gold the seals of the City and of the County Medical Society. There is space for the doctor's signature.

A device on the back makes it easy to hang on the wall, or to stand on a table or mantelpiece. The wording seems to be successful in providing a card unobjectionable to physicians, and appropriate even for those specialists whose work lies outside of the field of child care.

Four million small folders will be distributed through the mail by the electric and gas companies. An elaborate diphtheria handbook is about to be issued. An illustrated catalog of publications will be supplied upon request to Diphtheria Prevention Commission, Department of Health, New York, N. Y.

HONORABLE MENTION

To Public Health Federation, Cincinnati, O.: for having a full table of contents in *A Survey of Community Dental Facilities,* and for having a brief bibliography in the same report (even though several of the references are too incomplete for ready use).

To the Milbank Memorial Fund, 49 Wall St., New York, N. Y.: in its 1927 annual report—for the effective presentation of professional activities through text, diagrams, tables and illustrations. It is disappointing to note the lack of an index so that, for example, health education must be searched for under such general headings as " Other Activities " or " Special Health Activities." Closer relations between the beautifully produced illustrations and the captions under several of them would be more satisfactory to some readers; and the addition of office addresses to the pages of operating and supervising organizations would be helpful.

To State Charities Aid Association, New York, N. Y.: For " Milestone 55," annual report, with table of contents and other features.

To State Tuberculosis Commission of Connecticut: For a 1926–1928 report using paper for the cover which makes a public document almost attractive; for numerous page half-tones; for partial table of contents.

MOTION PICTURES

The amateur movie clubs, already existing in some high schools and colleges, and many in cities outside of schools, might be enlisted in health scenarios. At least the school audiences would be reached at a moderate expense for materials supplied.

" Speaking the Motion Picture's Language." *The Motion Picture,* 469 Fifth Ave., New York, N. Y. Vol. 4, No. 12. *Free.* Glossary of slang or " technical phrases."

RADIO

" Curtailment of abuses in the radio broadcasting of medical advertising is likely to follow the adoption of a code now under consideration by the National Association of Radio Broadcasters and the Better Business Bureaus, according to a recent editorial in the *Journal of the American Medical As-*

sociation," says *Editor and Publisher,* which calls attention to the need of control and quotes liberally from the *Journal* editorial.

Every weekday the New York City Y. M. C. A. conducts two radio periods, "Health Talk—Gym Class," 9:30 a.m., WOV, 265 M.–1,130 Kc.; and "Health and Happiness Exercises," 11:10 a.m., WGBS, 254 M.–1,180 Kc.

The *Journal of the A. M. A.* announces week by week two groups of broadcasts—at 10:00 a.m. and 8:00 p.m., Central time. Daily except Sunday. Station WBBM, 389.4 M.–770 Kc.

Health agencies having regular broadcasting periods are invited to report hours, stations, etc., for advance announcement.

How about getting local reports on health talks from different stations?

POSTERS

Three of the wood block posters of the Chicago Tuberculosis Institute were included in the Second Annual Exhibition of Chicago Fine Printing. The posters were entered by the Department of Printing Arts of the School of the Art Institute of Chicago.

A poster, 12" by 19", with portrait of "Lillian," who a "few months ago" was not the care-free, happy girl she appears in the picture, is a superior example of the community chest type of poster issued largely for display in factories and offices. The dull-finished India paper with brown ink suggests how some of our drab black and white posters might be improved. Community Fund, 51 West Warren St., Detroit, Mich. *4 cents.*

"Milking Time in Many Lands" is the title of companion posters, 42" by 12". Health Education Department, Dairymen's League Coöperative Association, 11 West 42d St., New York, N. Y. *Each 25 cents.* Each poster includes four panels headed "Peru-Lama," "Arabia-Camel," etc. Vivid colors with simple sketches from which much detail has been eliminated, with good lettering, make them strikingly good to look at and effective for the teacher or mother who wishes to talk about milk. Produced by a silk screen process which avoids the "prettiness" found in many posters. Planned by Louise Franklin Bache, publicity director of the National Probation Association, who is consultant in health education to the Dairymen's League.

"Safety Posters—1929," National Safety Council, 108 East Ohio St., Chicago, Ill. Illustrated catalogue of posters supplied to members. *Free.*

"Tests to Determine if Your Poster Is Effective." *Northwestern Health Journal,* 11 West Summit Ave., St. Paul, Minn., Feb., 1929. *10 cents.* Simple statement of important elements.

"Toy-making Turned to Gay Propaganda," *Survey Graphic,* Mar., 1929, describes and illustrates the group of felt posters produced in Italy for the National Dairy Council, 307 North Michigan Ave., Chicago, Ill., from whom the set may be borrowed. They illustrate a poster form in which some volunteers might become interested. In practice, for effective use, the amount of detail calls for a size two or three times as large as these gay specimens.

TELLING TITLES

"Are You a Dietary Diplomat?"—*Hygeia.* Young America's dietary likes and dislikes.

"Digger of Graves"—Racine, Wis., Board of Health. Press release on "when the spreader of 'colds' becomes socially unpopular, he will cease to be a public menace."

"Don't Be a Transmitter"—*Canadian Red Cross.* About colds.

"Must Mothers Die?"—*News Letter.* Dutchess County Public Health Association.

"What's Happened to the Stork?" *Bellevue-Yorkville Health News.* A paragraph on fewer births in the district.

BOOKS AND REPORTS

Manson's Tropical Diseases. A Manual of the Diseases of Warm Climates—*Edited by Philip H. Manson-Bahr. (9th ed. rev.) New York: Wood,* 1929. 921 pp., 401 figs. Price, $11.00.

A book which has reached its ninth edition has proved its value. In this latest, especial attention has been directed toward the treatment of tropical diseases, which is happily becoming stabilized and effective.

The subject matter has been brought up to date. The illustrations are abundant and excellent, the 23 color plates being especially good.

The work will continue to hold its place as a standard text and reference, and can be unhesitatingly recommended.

The make-up and printing are good.

M. P. RAVENEL

Comparative Neurology. A Manual and Text for the Study of the Nervous System of Vertebrates—*By James W. Papez. New York: Thomas Y. Crowell,* 1929. xxvi + 518 pp., 315 figs. Price, $6.00.

Biologists having to deal with the complex details of the vertebrate nervous system will find in the manual prepared by Professor Papez a very welcome addition to the literature of this highly specialized subject. It is divided into three sections: The first deals with the gross anatomy of the brain of mammals; the second with their microscopic structure; and the third with the nervous system of the lower vertebrates from the reptiles to the fishes. From the standpoint of comparative anatomy and of the logical development of the subject it would have been better to have progressed from the simpler organization found in the lower classes of the vertebrates to that of the more complex mammalian type. The book is founded upon a laboratory course in comparative neurology and is largely descriptive of laboratory and museum material with only occasional references to function until one reaches Chapter 33, on the physiology of the cerebral cortex.

The volume is splendidly illustrated with well executed figures of the complex structures, very fully but uniformly and simply labelled, so that the reader may know at once the nomenclature of the salient features of any of the many illustrations. This feature alone places the book in a unique position among neurological works. A large proportion of the illustrations are new and the range of sources is a wide one. An abbreviated bibliography is given at the end of each chapter. The book is an excellent laboratory manual and a very convenient work of reference.

C. A. KOFOID

Improvised Equipment in the Home Care of the Sick—*By Lyla M. Olson, R.N. Philadelphia: Saunders,* 1928. 109 pp. Price, $1.25.

Miss Olson's little handbook points away from the complexities and extravagances of present-day equipment in the care of the sick in home and hospital. It shows with interesting illustrations and clear explanations that the art of improvising the necessities and comforts of the sick room may be revived. It points out the opportunity that the Nurses' Training Schools have in fitting the student nurses to care for the sick in all walks of life. We are reminded that the large majority of patients with

whom the nurses will come in contact, either as private duty or public health nurses, need and would welcome a return to simplicity in home care of the sick. Every nurse in practice will find the book full of practical suggestions.

HARMINA STOKES

Parents and Children—*By Ernest R. Groves and Gladys Hoagland Groves. Philadelphia: Lippincott,* 1928. 196 pp. Price, $2.00.

This personable third of the Groves' brain children is built along the authors' characteristic style and should be as popular as its predecessors. In a field teeming with daring and unfeeling exploiters, these authors stand out for their sound psychology and their sympathetic and constructive treatment of family relationships.

Until educational institutions pay more attention to that mysterious thing, eugenics, parents will have to depend upon these and other sound authors for their help on family relationships. The sad part of it is that so many parents turn to the bizarre authors who give them more of a thrill for their money—and then they wonder why the magic tricks will not work.

The Groveses do not necessarily furnish a technic of family relationships. I should claim for them that they do give the parent sound basic material. Then let the parent think in terms of his or her own situation.

This particular book is a collection of articles which have appeared in various parental, religious, and educational magazines. The illustrations are of the usual type which appeals to parents—babies, dogs, adults holding young children, etc.—all with intriguing titles, such as "Pals" and "Life's a Joke." Chapter titles include, "Inside Tips for Fathers," "The Emotional Life of the Child," "What to Tell Children About Death," and "The Dangerous Mother." In the Appendix are questions and references which make the book easier for use in child study classes, which are a bit messy unless carefully conducted.

Parental education is in the formative stage and is, for the most part, theory. But in various laboratories, this new and wonderful social contribution is being developed, and since the movement is supported liberally by far seeing benefactors, we may rest assured that better parents are not only a possibility but a certainty. One has only to study the impressive work of such groups as the Institute of Child Welfare Research at Teachers College to see these theories in action with small groups of parents, and then one wishes that a greater number of parents could have such opportunities. But for the present, most parents must depend on the Groveses and other sound and pleasing writers for their meager share of a great benefit. But better times are coming—better times and better and happier families.

HUGH GRANT ROWELL

Healthy Growth. A Study of the Relation between the Mental and Physical Development of Adolescent Boys in a Public Day School —*By Alfred A. Mumford, M.D. New York: Oxford University Press,* 1927. 348 pp. Price, $5.00.

This excellent study attempts to show what relationship exists between mental achievements and physical development. It contains a large number of references to basic scientific studies in physiology and the physiology of exercise, with brief digests of the essentials of such studies.

It attempts to trace the relation between types of physique, and physiological and physical qualities, to mental attainments and school progress. Such factors as electrical resistance of the skin, and oxygen consumption, to mental activity, and of mental activity to physical development are discussed.

Figures on absolute growth of school

boys are given, and there are studies of the relative growth of these boys in such factors as height, weight, chest girth, and vital capacity. The buoyancy index is measured. A study of stamina, its evidences, relation to age periods, and tests for it, is included.

There is also a most interesting chapter on the ailing child, and the relation of health to mental attitudes and to the physiological and physical characteristics.

This is an excellent treatise for educators and physicians who are engaged in work among adolescents. It merits particular study by physical educators and by those responsible for competitive athletic efforts. CHARLES H. KEENE

Bacteriology. A Text-book of Microörganisms—*By Fred Wilbur Tanner. New York: Wiley,* 1928. 548 pp. Price, $4.50.

This book is designed for those entering on the study of microbiology. The author has selected students as his critics rather than those whose experience entitles them to form opinions. If he can be satisfied with this, we wish him happiness.

While there is useful information in the book, much space is given to material the value of which is more than questionable. For example, 60 pages are given to nomenclature and classification of bacteria, though the author recognizes that no satisfactory classification has yet been made. When those who are best fitted to do such work acknowledge the difficulties, and cannot agree among themselves, it hardly seems worth while to burden the minds of beginning students with such discussions.

There are many mistakes which could have been avoided by reference to any standard text, though teachers should always, when possible, consult original sources. As examples: Koch is said to have discovered the anthrax bacillus in 1876, though it was seen in 1849, again in 1850, cultured in 1860, and its etiological relation to the disease shown in 1863; the discovery of the diplococcus of pneumonia is credited to Weichselbaum in 1886, though it was described by Pasteur in France, and Sternberg in the United States in 1880; the discovery of the tubercle bacillus is given as 1884 instead of 1882; the use of anthrax vaccine is said to have "started a method of combating disease," though later in the same paragraph it is shown that the discovery of bacterial vaccines began with chicken cholera.

The English is frequently very poor. Some definitions in the glossary are not only wrong, but absurd.

It is a pity that this book will be used by many whose subsequent training will not correct the misinformation given. We regret that the publishers, whose name has long stood as a synonym for scientific exactness, have put out a book with so many inaccuracies and deficiencies. M. P. RAVENEL

Handbook of Bacteriology—*By Joseph W. Bigger, M.D., Sc.D. (2d ed.) New York: Wood,* 1929. 452 pp. Price, $5.00.

The favorable impression made by the first edition of this book is sustained by the second. It is still a readable and succinct guide for the student.

A few criticisms may be made, most of them concerning omissions rather than errors. The average American would not be willing to make Loeffler's blood serum by the old fashioned method described—2 hours for hardening, and 3 days for sterilization. The autoclave method in which both are done in one operation is used in this country.

The Widal test is described only for serum, and 20 minutes at 37° C. is allowed before examination. The use of dried blood is not mentioned.

The preparation of antigen for the Wassermann reaction omits many of

the safeguards generally employed in this country. We are advised to take a "fresh, healthy human heart" (where can this be had except in Chicago?), grind and extract with absolute alcohol, filter, and to 3 parts add 2 parts of a 1 per cent solution of cholesterin, and 70 parts of saline, giving a "turbid suspension," which is used. Apparently no test of any kind is made. There is no mention of icebox fixation.

The author has apparently never heard of the great improvement made in antianthrax serum in America by the use of spore vaccines, as he states that the most successful is that of Sclavo, made in asses.

The illustrations and printing are good, and for the purposes for which the book is designed, it can be heartily commended. Though printed in Great Britain, it is on excessively heavy paper.

M. P. RAVENEL

Public Health and Hygiene—*By Charles Frederick Bolduan, M.D. Philadelphia: Saunders,* 1929. Price, $2.75.

The author has had a wide experience in public health work, administrative as well as teaching. He has given us a manual for students which covers the ground well, is up-to-date, and in general correct. He is a believer in the historical method of teaching, and begins with a chapter devoted to history. We regret that he continues the fallacy of crediting Morton with the introduction of ether anesthesia, and Warren with having performed the first operation under ether, both being due to Long of Georgia, who removed a tumor under ether anesthesia in 1842, while the operation by Warren was done in 1846. Some other historical inaccuracies are noted, though they are chiefly omissions, probably due to the small size of the book, rather than errors.

The book is well printed, and the colored illustrations are excellent. Most of those in black and white are only fair, and some poor, showing signs of old age.

The book is much better than the average of its type, and can be commended in the field for which the author has designed it.

M. P. RAVENEL

Die Ernährung. Ausstellung für gesunde und zweckmässige Ernährung—*Berlin: Amtlicher Katalog, Verlag Gersbach & Sohn,* 1928. 300 pp. (4 plans.)

This official catalog of the Nutrition Exhibition held at Berlin, May 5 to August 12, 1928, is of interest to workers in hygiene and public health, since it gives a succinct summary of the aims and purposes of each of the several sections of the exhibition and enumerates the displays and exhibits designed to present each subject. It will be useful alike as a plan for public exhibits and as a résumé of current German scientific accomplishment in the field of nutrition. It deals not only with foods and their preparation, protection, and conservation, but also with water supplies and milk.

C. A. KOFOID

Play Day. The Spirit of Sport—*By Ethel Perrin and Grace Turner. New York: American Child Health Association,* 1929. 77 pp. Price, $.35.

Why play days; how play days develop the spirit of sport; the programs of major and minor sports carried out by several city high schools, universities, state teachers colleges, rural schools, and industrial units—all make up the contents of this helpful pamphlet. It is a unique contribution to the director of athletics of an institution or the promoter of civic recreation. The pamphlet is attractive in design, make-up and typography, the text brightened by several excellent photographic illustrations. It is published in coöperation with the Women's Division, National Amateur Athletic Federation.

A. B. TOWSE

Die Malaria in ihrer Bedeutung für die Geschichte Roms und der römischen Campagna—*Eine kulturhistorische Studie von Angelo Celli, Herausgegeben von Anna Celli-Fraentzel, mit einem Geleitwort von Prof. Dr. Henry E. Sigerist. Leipzig: Georg Thieme,* 1929. vi + 118 pp., 1 map. Price, 12 marks.

The author is a celebrated Italian investigator of the malarial parasites of man and a prominent worker in the field of malaria control. His practical work in these problems in the Roman Campagna has peculiarly fitted him to consider the historical aspects of the relations of malaria to the past history of this fever stricken region, so often depopulated and repopulated within historic times. Accordingly he has made an intimate study of available sources, and concludes that from the very beginning of historical records political causes, whether at the hands of Emperors, Goths, or Popes, are not to be charged with the devastations of human life and culture in this area immediately surrounding and tributary to the Eternal City, but rather malaria.

There is historical evidence of a cyclic aspect of recurrent epidemics in which the severity of the disease was marked. There is, however, little evidence of immunity in those who have suffered from attacks of malaria in any of its forms. Much progress has been made in recent years in systematic drainage of the swamps of the Campagna. Quinine in both tablet and liquid form for injection is supplied free by the State, and a staff of 43 physicians is in charge of the campaign. Extensive screening of houses is used as a protection against mosquitoes. Experiments in mosquito control are in progress.

The historical account is supplemented by an extended appendix citing literature covering the prehistoric, classical, medieval and modern periods. This is of great epidemiological value, since the references in historical, political, sociological, as well as medical literature, have been sought out and interpreted by a competent epidemiologist. The treatise is a critical contribution of permanent value to the historical aspect of the epidemiology of this important disease. CHARLES A. KOFOID

The Elements of the Science of Nutrition—*By Graham Lusk, Ph.D., Sc.D. (4th ed. rev.) Philadelphia: Saunders,* 1928. 844 pp. Price, $7.00.

The fourth edition of this book will be welcomed by all students of the science of nutrition as well as by the medical profession. The author has long maintained the premier position in studies on nutrition, and since its first appearance, his work has been a standard reference.

The preface contains one statement which can be commended to all authors, should be printed on a card, and placed on the desk of every would-be author: "Throughout, no statement has been made without endeavoring to examine the evidence on which it is based." Without doubt, this conscientious view has been responsible for the high position Professor Lusk and his writings have always occupied. This latest edition, which has been entirely reset, will, like its predecessors, remain the standard book of reference.

The make-up and printing are excellent. M. P. RAVENEL

Nursing Care of Communicable Diseases—*By Mary Elizabeth Pillsbury. Philadelphia: Lippincott,* 1929. 463 pp. Price, $3.00.

This is a very valuable book, by means of which the hospital and public health nurse may become well acquainted with prophylactic technic. It also contains a concise and well arranged reference to the more recently accepted administrative procedures for

the control of communicable diseases. Frequent reference is made to the Report of the Committee on Standard Regulations for the Control of Communicable Diseases of the American Public Health Association.* It also shows the author's acquaintance with the surveys of health work in large cities made under the direction of the Committee on Administrative Practice.

It is quite natural that when one prepares a book of this character greater emphasis should be placed upon the technic employed in those institutions with which the author has been associated. She therefore lays particular emphasis on certain practices of communicable disease control, within and without the hospital, in Connecticut, especially New Haven, and in Providence and New York City. As the surveys in these cities are admirable examples on which to base and recommend practice, the book makes a very valuable guide for nurses.

A sketchy outline is first given of the causes of disease and the known means for control. Individual immunity and resistance to disease are discussed, as also means of public control. In two well written chapters, the prophylactic technic of nursing is outlined. There follows a chapter on each one of the diseases which are now generally recognized as being reportable.

The book is well illustrated and a great deal of valuable material has been crowded into its 463 pages.

HENRY F. VAUGHAN

* *A. J. P. H.*, Mar., 1927. Reprints obtainable from A. P. H. A. 25 cents.

Living with the Law—*By June Purcell Guild. New York: New Republic,* 1928. 266 pp. Price, $1.00.

This, the 24th in the paper bound, blandly uncut pages, New Republic Dollar Series, is a popular contribution by an obviously "social minded" author to the enlightenment of the laity on the confused and conflicting tenets which comprise what is known as "The Law." Since ignorance of the subject is legally inexcusable, this description and discussion of the law as it applies to persons and social problems ought to be of some value to the befuddled lay (non-legal) body of our citizens. It may even instruct the sanitarian, though neither he nor anyone else will get much out of the chapter on public health, which is the leanest and least satisfactory in the book. On the other hand, the chapters on mental hygiene seem excellent, and those on marriage and divorce, husbands and wives, and parents and children are likewise valuable. Those on aliens and immigration are distinctly less so, but there is a good finish on criminal law and trials. The book is well printed, dispenses with an unnecessary index, and has an inadequate bibliography. It is worth a dollar to those who have to live with the law. JAMES A. TOBEY

Mother and Child. Advice to the Young Wife and Mother of Today —*By Mary Lyon* (*Mrs. Massey Lyon*). *Macmillan,* 1928. 215 pp. Price, $2.00.

This is an ambitious attempt to guide the young mother along a very extensive highway beset with many possibilities. The language and materials suggested are naturally those of England, and similar books for American mothers which appear to me to be more useful in this country are available. In connection with diphtheria, immunization by means of toxin-antitoxin is not even mentioned, though the therapeutic use of antitoxin is recommended. Such small books touching on so many subjects may tend to frighten, instead of inform, young mothers, but perhaps they serve to stimulate a demand for periodic examination and instruction by the physician. If so, they may serve a useful purpose. The print is small, but the subjects are well marked. LEROY A. WILKES.

Community Hygiene—*By Dean Franklin Smiley, A.B., M.D., and Adrian Gordon Gould, Ph.B., M.D. New York: Macmillan,* 1929. 350 pp. Price, $2.00.

This book is presented as a companion volume to "College Textbook of Hygiene" by the same authors. As the title implies, it considers those facts which concern the promotion and protection of public health.

Beginning with a short history of public health work, four sections follow, covering the subjects usually included in a book of this type.

The material is sound, well stated, and sufficiently inclusive. With a few exceptions, the illustrations are only fair. The printing and make-up of the book are good. M. P. RAVENEL

Laws of Pennsylvania Relating to Social Work—*Compiled by John S. Bradway. Philadelphia: Public Charities Association of Pennsylvania,* 1929. 253 pp. + Index. Price, $2.50.

A valuable compilation of the Pennsylvania laws on all phases of social work, with a good chapter on public health and safety. It is indispensable to health authorities and health workers in Pennsylvania, and of interest to sanitarians in other states as an example of a useful and practical compilation of laws on important social subjects.

JAMES A. TOBEY

The Diagnostics and Treatment of Tropical Diseases. A Compendium of Tropical and Other Exotic Diseases—*By E. R. Stitt, M.D., Sc.D., LL.D. (5th ed. rev.) Philadelphia: Blakiston,* 1929. 918 pp. Price, $9.00.

It is noteworthy that two outstanding books on the subject of tropical diseases should have appeared in the early months of 1929. No living man can write more authoritatively on the subject than Rear Admiral Stitt, who, besides being a master of the literature, has had a wide personal experience of which he has made good use.

The present volume contains six new chapters and much new material on topics found in older editions. The author has called to his aid several medical officers of the Navy, who have contributed to a number of subjects.

Approximately one-fourth of the book is given to an appendix, in which matters of great importance are treated. Here one finds an Index of Clinical Diagnosis, designed to suggest quickly diagnostic possibilities. Of especial interest also is the section on Tropical Hygiene. It is well stated that while preventive medicine is of prime importance in temperate climates, it is undoubtedly the first consideration in the tropics.

The book has been brought up to date. The author is well known for his ability to write clearly and to give those facts which the reader needs to know.

The illustrations are good. The general make-up of the book is excellent, though we wish lighter paper had been used. It is easily the best book on the subject which America has produced, and one of the best in any language.

M. P. RAVENEL

Practical Clinical Laboratory Diagnosis—*By Charles C. Bass, M.D., and Foster M. Johns, M.D. (3d ed. rev.) Baltimore: Williams & Wilkins,* 1929. 187 pp. Price, $7.50.

This is practically a new book, entirely rewritten, reillustrated, and brought up to date. It even has a new publisher.

The former editions were favorably received, and were extensively used; so the authors have had the advantage of criticisms and suggestions, which they have made use of in the present volume. They have not burdened the pages with discussions, but have adhered to the

original idea of giving those procedures which have been found the best and simplest. While some may criticise this, it is, in the reviewer's opinion, the most useful plan for the average student as well as laboratory worker.

Except for the colored plates, which are good, the illustrations are not attractive, though they fulfil their purpose. Many of the microphotographs are poor, and might well have been omitted. The material is sound, and given in an understandable fashion. The book will doubtless continue to enjoy its well deserved reputation. M. P. RAVENEL

Handbook of Microscopical Technique. *For Workers in Both Animal and Plant Tissues—Edited by C. E. McClung, Ph.D. New York: Hoeber,* 1929. 495 pp. Price, $8.00.

One undertakes the reviewing of a book of this type, written, as it is, by a number of experts, with considerable trepidation. Since no one is apt to be an expert along all the lines considered, the present reviewer has taken the precaution of getting the opinions of a number of specialists on their particular subjects.

Needless to say, the book contains an abundance of useful material, most of which is well and correctly put. The two outstanding faults are that routine and standard procedures common in most diagnostic and teaching laboratories are neglected for the introduction of those which are unusual and special. The second fault is common to many books of this type, namely, considerable duplication and lack of organization.

The subtitle would limit the book to tissue work; yet considerable space is given to the staining of acid fast organisms, flagella, spores and capsules. In spite of this, one looks in vain for Levaditi's stain for spirochetes or for any method of staining Negri bodies. Neither is even mentioned in the index. A number of other omissions of commonly used and useful methods are noted. Terry's method for rapid diagnosis of tumors is not mentioned, nor is Naylor's technic for staining plant tissues. In a number of places the directions given are incomplete and unscientific. We are told that " higher or lower temperatures " may be necessary for fixing, but the range is not stated, and no mention is made of the rapid method by boiling in 10 per cent formalin. Again we are advised to use pieces of tissue " not larger than a small pea." Why not give more exact measurements according to the metric system? No mention is made of the use of methyl alcohol as a fixative, especially for blood films or smears from exudates. Under the head " Acid Alcohol," page 475, " a 1 per cent solution " is recommended for decolorizing; yet we look in vain to find out what is meant by acid alcohol, and whether the 1 per cent refers to the acid, the alcohol, or to the mixture. Referring to either of the two other pages (321 and 422) on which acid alcohols are mentioned, one finds a number of formulas containing various acids recommended chiefly for fixing tissues. There is no indication of the one referred to as useful for decolorization in a 1 per cent solution.

Some of the procedures recommended are not up to date. For example, in discussing Wright's blood stain, page 245, the method in common use upon the recommendation of Wright himself is not mentioned. Many similar mistakes and omissions could be pointed out, but these will suffice to give a general idea of the shortcomings of the book.

The make-up and printing are in general good, though the paper is heavy and the surface too much glazed. A number of misprints, even of proper names, are noted—occasionally on the same page a proper name will be spelled in two ways. The outstanding feature of the book is Chapter 10, on Stains and Staining. M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

New York State—One of the most complete reports of marriage statistics has recently been published by the New York State Department of Health for the years 1921 to 1924. This report also contains an introductory analysis for the years 1916 to 1924. A detailed table of contents facilitates reference to special summary and rate tables.

In 1927 the Domestic Relations Law was amended, providing for the direct monthly forwarding of the original marriage documents by town or city clerks to the state department and of copies of these documents to the county clerks. This change, according to the Director of Vital Statistics, has brought about a marked improvement in the timeliness and completeness of marriage returns and will make possible the publication of statistics of marriages simultaneously with those of births and deaths.

Los Angeles County, Calif.—The health department report for the year ending June 30, 1928, comprising 385 pages, forms a part of the annual report of all county bureaus. The most notable advances were the completion of the organization plan of new health centers, and the reduction of communicable diseases. During the past 13 years, the infant mortality rate in rural territory has been reduced almost one-third. "In spite of the general ignorance of the Mexicans, our work has reduced their infant mortality from 1 in 3 in 1915, to 1 in 11 in 1927." During the year, nearly 16,000 children between the ages of 1 and 9 years were immunized against diphtheria.

The Pomona health center was open to the public in December. This building, costing approximately $64,000, houses, as do all the major health centers, the division of Outdoor Relief, a small hospital of 6 beds, a number of treatment clinics operated mainly by volunteer assistants of the local medical men, besides the rooms of the local branch of the county health department. The Santa Monica health center, costing approximately $83,000 (including land) was opened in 1928. During the year a large center was planned for Belvedere Gardens, an area occupied by some 120,000 people. This center, containing 22,150 sq. ft. of floor space, is nearing completion at a cost of $83,000, plus $13,000 for the land.

The total population served by the department was 657,555. The expenditures by the county for functions strictly chargeable to public health amounted to 92 cents per capita. Including expenditures by the county recorder for vital statistics, and by school boards for nursing and certain dental activities, the amount was $1.05 per capita.

Child Labor in Mississippi—A report, just from the press, of a study, *Child Labor in Mississippi*, made by the National Child Labor Committee in the fall and winter of 1927–28, reveals no evidence of any deliberate abuse of children. The foreword to the report states:

> It is the same old story; an unconsidering public accepts with but little question low legal standards, and with even less question lack of enforcement. Poor laws are nullified by common consent and there is no fully informed public to decree and enforce by the law of custom what the state and local authorities fail to decree and enforce.

Only those children of 12–16 years of age, who were working regularly and received pay for their work, were included in the study. In the towns selected, the names of all children between 12 and 16

years appearing on the school census were checked against the school attendance records. Those not in school were interviewed at their homes and a record of their work or idleness was made. The children working part time were interviewed at school.

Mississippi, along with 3 other states only, has a 44 hour week for working children. The 8 hour day, and night work provision of the law measure up to the standards generally adopted in other states; but these provisions, fine as they are, are applicable only to children working in mills, canneries, workshops, factories, and manufacturing establishments.

The study of these child laborers, 1,891 in number, shows that 56 per cent were white; 44 per cent, Negroes; 65 per cent, part-time workers, and 34.7 per cent, full-time workers; 33.3 per cent, workers whose jobs were covered by law, and 66.6 per cent, workers whose jobs were not covered by law.

A study of the ages of these working children reveals that 33.3 per cent were 13 years of age or less; 35.7 per cent, 14 and 15 years; and 31 per cent, 16 years or more.

Three-fourths of all the full-time children were working more than 8 hours per day, the average day for all children being 9.6 hours. For 83.1 per cent of the children 13 years or less, 74.7 per cent of those 14 and 15 years, and 71.2 per cent of those 16 years and over, a work day of more than 8 hours was the lot. Of the part-time children 47.1 per cent worked more than 8 hours on Saturday.

Of all the full-time children only 11.5 per cent worked 44 hours or less per week. In considering the age with respect to hours of work per week, it was found that 88.1 per cent of those 13 years or less, 84.5 per cent of those 14 and 15 years, and 96.4 per cent of those 16 years or more, worked more than the legal week of 44 hours. As to part-time children, when the working hours are added to the hours in school, it is shown that more than two-fifths (43.5 per cent) worked more than 44 hours per week.

From the standpoint of the full-time children, night work was of comparatively little importance; but for part-time children, it was of great importance. Nearly two-fifths of the latter were found to be working at night.

Briefly, it may be stated that: (1) Many children are engaged in occupations not covered by the child labor law, for whom there is no restriction as to either age or conditions of work. (2) Many children are engaged in occupations covered by the child labor law at an age which is entirely prohibited. (3) Many of the children who have reached the legal age for such employment are employed in violation of the provisions regarding hours and night work.

Racine, Wis.—The 1928 honor roll of health reports includes Racine, where the health officer in 58 mimeographed pages, bound in attractive light blue covers, has prepared a document worthy of study. This city of 75,000 people has a health department budget in 1929 of $43,870 as compared with $39,895 for the previous year. A birth rate of 19.3, a death rate of 8.9, and an infant mortality rate of 48.7 are recorded. Budget data for 6 years and death rates by principal causes for 5 years are tabulated for comparative purposes.

A feature of the report is a reproduction of attractive posters used by the department in factories and stores. The last 25 pages of the report are devoted to *Appraisal* results on the 1928 schedule of the Committee on Administrative Practice. These results are compared graphically with preceding appraisals. It is noteworthy that the cost of 125 copies of this report was only $69.11, exclusive of the time of the staff.

Reference is made to four educational leaflets published during the year. One of these, "This is no April Fool," was printed in green to correspond in size and shape to the gas and electric bills and was distributed to every house with these bills by courtesy of the Wisconsin Gas and Electric Company. Its title was suggested by the fact that distribution was begun on April first. It set forth the importance of smallpox vaccination and announced the annual campaign of vaccination clinics beginning April 1. During the year, the health officer gave 27 ten minute radio talks on health.

Nursing services, according to a table showing time distribution by services, 1924–28, have increased in all phases except those relating to the supervision of acute communicable diseases. The largest increase in nursing service is in the interest of infants under one year of age. Every nurse delivers to babies in her district a certificate of birth registration incorporated in a baby health booklet, and on the baby's first birthday, delivers a greeting letter including health advice.

Montana—The provision of facilities to investigate spotted fever is outlined in the 1927–28 biennial report. The U. S. Public Health Service has given financial aid to Cascade, Lewis, Clark, and Big Horn Counties to maintain full-time health departments, and has for a number of years been doing investigation work on spotted fever. The last session of the legislature appropriated $60,000 to construct a laboratory in the Bitter Root Valley in order to supply proper quarters for carrying on the work of the U. S. Public Health Service and the State Board of Entomology. This Service has developed a vaccine for the prevention of Rocky Mountain spotted fever, which is furnished free to the doctors of the state on application.

State law places milk control in the hands of the Livestock Sanitary Board. The American Child Health Association, on the request of that board and the State Board of Health, made a milk survey in various towns of the state. It is reported that 2 milk-borne epidemics occurred during the biennium, 1 of scarlet fever and 1 of typhoid, due to carriers handling the milk in dairies.

> The only absolute prevention of such epidemics is proper pasteurization of milk. We do not believe it feasible at the present time to enact and enforce a state law for universal pasteurization, but we do urge cities to pass ordinances requiring the pasteurizing of milk sold in towns where proper inspection of pasteurizing plants can be arranged for.

Maryland—The 1928 report of the Bureau of Sanitary Engineering of the Department of Health opens with the gratifying statement that by far the lowest typhoid fever incidence in the history of the state is recorded for last year. The rate for the state was 5.2 per 100,000, that for Baltimore being 4.2. Ten years ago the rate for the state was 16.9.

The Hagerstown 10 m.g.d. water filtration plant and accessories on the Potomac River were put in service at an approximate cost of $1,250,000. Progress is noted in the development of other water supply and sewage disposal systems. On account of the rapidly increasing popularity of outdoor life, it has become necessary each year to make a complete study of the camps throughout the state with respect to their water supply and sewerage facilities. The activities of one man were devoted to Anne Arundel County, in which the greatest number of camps are located. The value of this work in reducing sporadic typhoid fever has already been apparent. It is interesting to note that one engineer is engaged in field studies of all milk pasteurization plants outside of Baltimore. During the year there were 1,996 field inspections, 205 permits issued, 5,298 samples collected, and over 80,000 miles of travel.

BOOKS RECEIVED

HYGIENE AND PUBLIC HEALTH. (8th ed.) Parkes and Kenwood. Philadelphia: Blakiston, 1929. 823 pp. Price, $7.00.

WHO'S WHO AMONG THE MICROBES. By William H. Park and Anna W. Williams. New York: Century, 1929. 302 pp. Price, $3.00.

A MANUAL OF HELMINTHOLOGY: MEDICAL AND VETERINARY. By H. A. Baylis. New York: Wood, 1929. 303 pp. Price, $10.00.

PROTOZOOLOGY. By John Gordon Thomson and Andrew Robertson. New York: Wood, 1929. 376 pp. Price, $11.00.

THE STRUGGLE FOR HEALTH. By Richard H. Hoffmann. New York: Liveright, 1929. 341 pp. Price, $3.50.

AGELESS YOUTH. By Charlotte C. West. New York: Crowell, 1929. 466 pp. Price, $3.00.

YOUR EYES AND THEIR CARE. By Edgar S. Thomson. New York: Appleton, 1929. 175 pp. Price, $1.50.

FOODS OF THE FOREIGN-BORN. By Bertha M. Wood. Boston: Barrows, 1929. 110 pp. Price, $1.25.

STUDIES IN NUTRITION—INFLUENCE OF SALTPETER. Vol. II. By Ward J. MacNeal. Urbana: University of Illinois Press, 1929. 406 pp. Price, $5.00.

YOU AND THE DOCTOR. By John B. Hawes, 2d. New York: Houghton Mifflin, 1929. 181 pp. Price, $2.00.

ANIMAL PARASITOLOGY. By Robert Hegner, Francis M. Root and Donald L. Augustine. New York: Century, 1929. 731 pp. Price, $6.50.

BACTERIOLOGY OF THE HOME. By Ava L. Johnson. Peoria: Manual Arts Press, 1929. 167 pp. Price, $2.25.

GOOD HEALTH. By Ian S. Thomson. New York: Longmans, 1929. 122 pp. Price, $1.40.

GUIDE FOR A HEALTH PROGRAM. Grades One, Two and Three. By Jessie I. Lummis and Williedell Schawe. Yonkers: World Book Co., 1929. 196 pp. Price, $1.24.

ADVENTURES IN HEALTH. By Nathalie Forbes Moulton. Boston: Little, Brown, 1928. 140 pp. Price, $.70.

EVERYDAY DOINGS IN HEALTHVILLE. A Health Reader. By Emma Serl. New York: Silver, Burdett, 1929. 128 pp. Price, $.68.

PLAY DAYS FOR GIRLS AND WOMEN. By Margaret M. Duncan. New York: Barnes, 1929. 87 pp. Price, $1.60.

RECREATIVE ATHLETICS. (rev. and enl.) Prepared by the Playground and Recreation Association of America. New York: Barnes, 1929. 200 pp. Price, $1.00.

AN EXHIBITION HANDBOOK. Special Demonstrations Illustrating Features of the Work in Physical Education in the Newark Public Schools. Assembled by Randall D. Warden (rev. ed.) New York: Barnes, 1929. 107 pp. Price, $1.00.

AN HOUR ON HEALTH. By Morris Fishbein. Philadelphia: Lippincott, 1929. 158 pp. Price, $1.00.

THE SOCIAL WORKER IN FAMILY, MEDICAL AND PSYCHIATRIC SOCIAL WORK. By Louise C. Odencrantz. New York: Harper, 1929. 374 pp. Price, $2.50.

TEACHING HEALTH IN FARGO. By Maud A. Brown. New York: Commonwealth Fund Division of Publications, 1929. 142 pp. Price, $1.50.

PHYSICIAN AND PATIENT. Personal Care. Edited by L. Eugene Emerson. Cambridge: Harvard University Press, 1929. 244 pp. Price, $2.50.

THE NEW PSYCHOLOGY OF THE UNCONSCIOUS. By C. W. Valentine. New York: Macmillan, 1929. 162 pp. Price, $1.60.

HEALTH SCIENCE AND HEALTH EDUCATION. For College Students and Teachers in Training. By W. Alfred Buice. New York: Wiley, 1929. 345 pp. Price, $3.00.

PROGRESSIVE RELAXATION. By Edmund Jacobson, M.D. Chicago: University of Chicago Press, 1929. 429 pp. Price, $5.00.

EDUCATIONAL ACHIEVEMENT OF PROBLEM CHILDREN. By Richard H. Paynter and Phyllis Blanchard. New York: Commonwealth Fund Division of Publications, 1929. 72 pp. Price, $1.00.

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NEWS FROM THE FIELD

SOCIAL SCIENCE RESEARCH COUNCIL

THE Social Science Research Council has elected the following members under the recently created classification of Members-at-Large: Professor Henry M. Bates, Dean of the Law School, University of Michigan; Dr. Adolph Meyer, Professor of Psychiatry, Director, Henry Phipps Psychiatric Clinic, Johns Hopkins University; Dr. C.-E. A. Winslow, Graduate School Chairman, Professor of Public Health, Yale University; and Professor Robert S. Woodworth, Department of Psychology, Columbia University.

HOSPITAL LIBRARY AND SERVICE BUREAU

ON the approval of the Board of Trustees and Delegates, the American Conference on Hospital Service has made an agreement with the American Hospital Association to maintain and administer the Hospital Library and Service Bureau on and after June 30, 1929.

To give the American Hospital Association full freedom in the administration of the bureau, Donelda R. Hamlin, Director of the Hospital Library and Service Bureau, has sent in her resignation to take effect June 25, 1929.

NEW VENEREAL DISEASE COMMITTEES

TWO new committees are to be formed to replace the Venereal Disease Section of the Associated Out-Patient Clinics Committee of the New York Tuberculosis and Health Association: one on clinics treating gonorrhea, and the other on those treating syphilis.

Dr. Thomas J. Kirwin is chairman of the first and Dr. Dudley D. Stetson chairman of the second.

The committee on syphilis held its



Members of the Los Angeles County Health Department and friends at the opening of the East Side Health Center, Belvedere Gardens—a suburban area near Los Angeles, Calif. The center contains 22,150 sq. ft. of floor space and cost $96,000. It houses the County Health Department, the district emergency hospital, clinics for the indigent sick, and the County Local Welfare Division. An estimated population of 175,000 will be taken care of here. This is the fifth of the new Health and Welfare units to serve the needs of the outlying districts of Los Angeles County.

first meeting on May 3, and plans were laid for an inclusive program and a study of all the clinics in the city caring for venereal diseases. This committee has as its aim the formulation of standards of clinic service and their promotion; promotion of economy and efficiency in the management of clinics; and, in conjunction with the Welfare Council, the coördination of their work, and with allied medical, health and social welfare agencies.

SOCIAL HYGIENE INSTITUTE

THE fourth annual Institute of the American Social Hygiene Association will be held in coöperation with the New York University, the Chautauqua Institution and the Chautauqua Summer Schools at Chautauqua, N. Y. Dr. Thomas W. Galloway will give two courses in social hygiene and Dr. Edith Hale Swift will give a series of lecture-discussions on parenthood and the character training of children. Descriptive leaflets can be obtained from the American Social Hygiene Association, 370 Seventh Ave., New York, N. Y.

DELTA OMEGA LECTURE

THE second annual lecture under the auspices of Delta Omega, the honorary public health society, was delivered at the Massachusetts Institute of Technology on April 12, 1929, by George T. Palmer, Dr.P.H. Dr. Palmer spoke on the school health program of the American Child Health Association, of which he is the Director of Research. Members of the Gamma Chapter at M. I. T. and of the Beta Chapter at the Harvard School of Public Health, as well as many others interested, were present.

Following the lecture, a dinner of the Delta Omega Society was held, with Dr. Palmer and Dr. James A. Tobey, of New York, national secretary of the society, as the principal speakers. Professor S. C. Prescott presided.

WHAT EVERY WOMAN SHOULD DO ABOUT CANCER

THE above is the title of a new publication issued by the American Society for the Control of Cancer. This small pamphlet describes in a brief, succinct manner the main types of cancer and their danger signals, advising medical attention if the latter are apparent. It concludes with a list of practical suggestions regarding ways in which women can help toward the control of cancer, both in their own homes and in society, in general.

DR. KARL IMHOFF VISITS UNITED STATES

DR. Karl Imhoff, the inventor of the famous Imhoff tank, and Mrs. Imhoff arrived in New York the latter part of April on a visit to this country. Their itinerary extended from New York to San Francisco, taking in North Carolina, Georgia, Louisiana and Texas along the southern route, and returning via Chicago, Ill.

PERSONALS

DR. ALLEN HUTCHESON has been appointed City Health Officer of Houston, Tex., succeeding Dr. A. H. Flickwir.

DR. DOUGLAS L. CANNON was unanimously elected by the State Medical Association, April 19, to the State Board of Health to succeed the late Dr. Samuel W. Welch.

DR. ALBERT COMPTON BRODERS, pathologist to the Mayo Clinic, received the honorary degree of doctor of science at the commencement of the Medical College of Virginia, May 28.

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Effect of Atmospheric Pollution Upon Incidence of Solar Ultra-Violet Light*

J. H. SHRADER, FELLOW A. P. H. A., MAURICE H. COBLENTZ, AND FERDINAND A. KORFF

Former Director; Chief, Division of Chemical Technology; and Chief, Division of Chemistry

Bureau of Chemistry and Food, Department of Health, Baltimore, Md.

THERE has been much discussion about the rôle of atmospheric pollution in the occlusion of solar ultra-violet light, but a great paucity of experimental work to ascertain the facts. As long as the subject is in the discussion stage, it lacks the stimulus to make it worthy of serious effort on the part of civic bodies to employ remedial measures, particularly when such efforts must overcome the inertia of public opinion as well as the active resistance of financial and commercial interests. It was to find out the facts that this work was undertaken.

In 1922, the International Union of Geodesy and Geophysics, meeting in Rome, Italy, made provision for an international study of the dust content of the atmosphere.[1] Kimball and Hand[2] determined the number of dust particles in the atmosphere of Washington, D. C., and its suburbs, over two winter seasons. The greatest number occurred in December and January, and the smallest in May to October inclusive. In December and January there was over twice as much dust in the city air (Weather Bureau) as there was in that of the suburbs (American University), but in February and March, the difference was only about 33 per cent. They showed that coincident with the decrease in consumption ratio of bituminous coal to anthracite coal, the dustiness decreased. They found about 18

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

per cent less dust at the top of the Washington Monument (500 ft.) than at its base, but more in both cases than at the American University. In Chicago the number of dust particles in the loop district was from 25 to 80 per cent greater than at Chicago University (in a residence section).

In 1927, Bundesen and his coworkers [3] found by spectrographic measurements that there was a materially lower incidence of solar ultra-violet light when the sun's rays traversed the smoke-pall arising from the stockyards than when the wind was from the northeast, which removed it.

It has long been recognized that some method must be adopted for measuring atmospheric pollution, particularly when the objective is to ascertain the rôle of smoke. The general plan has been to weigh and analyze the solid material which settles in catch-cups in stated periods. The results are expressed in terms of tons per square mile per year. This method has yielded very interesting data, particularly as carried out in the extensive investigations of the Committee on Smoke and Noxious Vapors Abatement in England,[4] the Mellon Institute in Pittsburgh,[5] the Herron Company in Cleveland,[6] and Monnett and Hughes at Crafton.[7]

Such data directed public attention to the subject, with the result that municipal ordinances were enacted, and in some cases enforcement facilities were provided, to combat the evil of a smoke laden atmosphere. Among such municipalities was Pittsburgh.

In 1926, a critical study of smoke control in Pittsburgh was made by Meller [8] to ascertain the result of 10 years' enforcement. It was found that whereas the amount of tar (representing smoke solids) was reduced approximately 70 per cent, the total deposit had increased about 40 per cent. Thus one type of pollution was reduced but another substituted, presumably due to the installation of blowers under grates.

If the health aspects of the relation of atmospheric pollution to the incidence of ultra-violet light are to provide the stimulus and constitute the basis respectively for the enactment and the structure of an anti-air-pollution ordinance, we need more definite information as to actual facts. Do suspended solids in the atmosphere actually occlude solar ultra-violet light? If so, are we any better off if we substitute siliceous for tarry solids; in other words, ash for smoke? Such was our problem.

Numerous methods have been proposed for the direct measurement of solar ultra-violet light. Coblentz [9] critically discusses a number of these. Winchester [10] states that determinations based on

the measurement of heat are unsatisfactory. We were forced to use available materials; so chemical methods were adopted, a number being run in parallel.

Our greatest reliance was placed on the lithopone method of Clark,[11] whereby a water paste of lithopone (a mixture of zinc sulphide and barium sulphate) on a microscopic slide under a quartz cover darkens to a reflection factor of 50 per cent in a time period inversely proportional to the intensity of the ultra-violet light. A study of this method by Brickwedde[12] showed that its activity begins with wave-lengths about 254 μμ, and extends to 335 μμ with the maximum at 313 μμ. Variations in the wetness of the paste made no difference in sensitivity. All determinations were made with material from the same batch. Our determinations were always read by the same operator at 11 o'clock in the morning. Within the working conditions of our experiments, the temperature factor was found to be negligible.

The next most useful chemical method was the methylene-blue-acetone-water solution, developed by Webster, Hill and Eidenow,[13] modified by Kimball and Hand.[14] The quartz tubes containing the solution were exposed for 24-hour periods and compared with a standard made up in like manner. Gillam and Morton[15] state that this method is sensitive to the following wave-lengths to the degree specified:

Rays below 275 μμ	88.0 per cent
Rays at 275–325 μμ	6.4 per cent
Rays above 325 μμ	5.6 per cent

Another chemical method run in parallel was uranyl sulphate, used by Anderson and Robinson.[16] Solutions of uranyl sulphate and oxalic acid were exposed for 24 hours in quartz tubes, and titrated with potassium permanganate to measure the photo-chemical decomposition of the oxalic acid. Gillam and Morton (cf. above) give the sensitivity as follows:

Rays below 275 μμ	60.8 per cent
Rays at 275–325 μμ	14.6 per cent
Rays above 325 μμ	24.6 per cent

We also used the so-called potassium iodide test of Pohle.[17] This consisted of exposing a standard solution of purified potassium iodide and dilute sulphuric acid in quartz tubes for 24 hours. The photo-chemical decomposition of the potassium iodide was measured by titrating with sodium thiosulphate.

In order to ascertain the distribution of suspended solids in the atmosphere, catch-cups were placed in three groups: one at the Health

Department, nearly in the center of Baltimore (Group A); five in an arc about 3 miles from the center, thus lying in the near suburbs (Group B); and three in an arc about 10 miles out in the country on farms well back from highways (Group C). Thus, the conditions of the atmosphere as indicated by the findings in Group C constituted our actual control. Any atmospheric pollution or light occlusion in the city which was at variance with the conditions in Group C was incident to city conditions, avoidable or not. In other words, Group C showed us what might be the best atmospheric condition that could be obtained locally. The cups were placed at street level, and protected from animals by locating them at fire engine houses where they could be kept under constant observation.

The determinations of settlings from the atmosphere were made from March, 1926, to October, 1928, but the data in relation to the incidence of solar ultra-violet light of only one year are presented. Some of the earlier lithopone measurements were open to such serious criticism that all readings for the year were discarded. The cups were collected each month and the contents analyzed. Table I gives the data collected from April, 1927, to April, 1928, inclusive, but the tonnage is expressed on a 12-month basis. It is the relative quantities which are significant.

TABLE I

CONTENTS OF CATCH-CUPS EXPRESSED IN TONS PER SQUARE MILE PER YEAR

	Group A	Group B	Group C
Total solids	1,800.0	800.0	340.0
Tar	8.7	5.6	3.2 (2.1)*
Ash	810.0	380.0	130.0
Ultra-violet light **	1.0	—	1.5

* Omitting an inexplicably high value
** Determined by lithopone at one station in Group C

The number of dust particles per c.c. of air was determined by J. J. Bloomfield of the U. S. Public Health Service, using the konimeter.

TABLE II

ATMOSPHERIC DUST DETERMINATIONS* MADE WITH THE KONIMETER

	Dust Count in Particles per c.c. of Air			
	Over 10 μ	Between 5 and 10 μ	Under 5 μ	Visibility during Tests
Group A**	1.0	1	85	Clear, hazy and smoky
Group B	0.6	1	51	Slightly hazy, clear and breezy
Group C	0.5	0	22	Clear

* Each figure is an average of four determinations
** One station

In view of the striking increase in the amount of ultra-violet light indicated in the area where the atmospheric pollution is least, we

checked the dependability of the lithopone method and the technic by a number of the other photo-chemical reactions described, making the determinations at the same time.

TABLE III

COMPARATIVE DETERMINATIONS OF ULTRA-VIOLET LIGHT MADE IN CITY AND COUNTRY

(Average of daily readings from June 16 to August 14)

	Place		Meteorological Control	
			Mean Temp.	Solar and Sky Radiation
Photo-chemical Agent	City	Country	Degrees	gm. cal. per min. per cm.
Lithopone	1	1.40	87–95	370–600
Oxalic Acid	1	1.04	87–95	370–600
Potassium Iodide	1	1.54	87–95	370–600
(Average of daily readings from November 23 to February 10)				
Methylene-Blue-Acetone	1	1.50	63–78	135–225
Lithopone	1	1.98	63–78	135–225

The actual readings are recalculated on the basis of city readings as unity

The readings were taken without any regard for the so-called " clearness " of the day. The term represents such an ill-defined condition that we considered there would probably be as much error in deciding when a day was clear as there would be in the reading itself. In order to ascertain just what difference there might be between readings taken over a long period when all days were used, versus so-called " clear days," the determinations in Table IV were made. These indicate the greater extent to which clear days transmit ultra-violet light than cloudy days.

TABLE IV

COMPARISON OF READINGS ON EACH DAY VERSUS CLEAR DAYS

	Clear Days		All Days*	
	City	Country	City	Country
Lithopone				
May–June	1	1.29	1	1.49
Nov.–Jan.	1	1.68	1	1.98
Methylene-Blue-Acetone				
May–June	1	1.42	–	—
Nov.–Feb.	1	2.00	1	1.50

* These readings are taken from Table III

From the above data it is clear that there is a far greater incidence of ultra-violet light in the country than in the city, and there is far more atmospheric pollution in the city than in the country. Carrying the inquiry further in order to ascertain whether these facts are really related, we measured the amount of atmospheric pollution and the incidence of ultra-violet light on the top of a city building 230 feet high, and coetaneously on the sidewalk near its base. The results are given in Table V.

These data show clearly that in the city there is an inverse relation

TABLE V

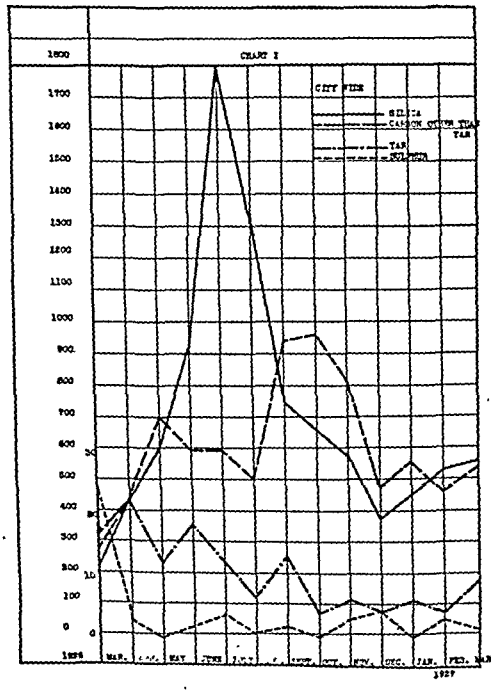
MEASUREMENTS OF DUST AND ULTRA-VIOLET LIGHT AT DIFFERENT HEIGHTS IN CITY

Dust	On Top of Building (T)	On Sidewalk (S)	Ratio (T : S)
Solids (Tons per sq. mile)	4,566	5,359	1 : 1.18
Tar (Tons per sq. mile)	22	53	1 : 2.41
Ash (Tons per sq. mile)	2,475	3,188	1 : 1.28
Ultra-Violet Light			
Lithopone*	0.43	0.31	
	0.39	0.26	
	0.54	0.39	1 : 0.7
Methylene-Blue-Acetone*	16.8	15.6	
	17.2	16.2	
	14.2	15.0	1 : 0.97

* Each figure is an average of twenty-five daily determinations

between atmospheric dirt and the incidence of ultra-violet light. It is quite presumable that atmospheric dirt is the cause of the occlusion of much solar ultra-violet light. To settle this point, we determined to measure the occluding effect of various dusts. We constructed a wooden box 36" by 18" by 18", with an inlet for introducing the dust, and with quartz windows 5½" by 5½" at opposite ends. Two small electric fans were placed inside to keep the dust in suspension.

The incidence of solar ultra-violet light was measured in the beam traversing both quartz windows, thus passing through the box, and again when the given dust was introduced. These results are recorded in Table VI.



In Chart I, we have presented curves showing how the constituents of atmospheric pollution vary over the season. During 1926 unusually large amounts of bituminous coal were used, followed by an increasing use of anthracite. Manufactured gas is being used to an increasing extent for heating. The spring of 1926 was unusually dry. The curves show that the greatest pollution from all sources occurs in the spring and summer seasons, and the peaks of the different kinds of pollution lie at different seasons.

Determinations of the incidence of bacteria in the air were

TABLE VI

RELATIVE INCIDENCE OF ULTRA-VIOLET LIGHT THROUGH SEVERAL DUSTS

	Percentage of transmission		
	1 gm. dust	2 gms. dust	5 gms. dust
Fuller's earth*	77 per cent	75 per cent	60 per cent
Street sweepings*	94 per cent	64 per cent	54 per cent
Lamp Black*	40 per cent	21 per cent	14 per cent

* Sieved through 200 mesh

made by exposing agar plates for approximately 5 minutes, incubating at 37° C. and counting the colonies. The peak of bacterial contamination lies at the time of year when the incidence of ultra-violet light is least.

Some measurements were made to determine the sky radiation in the city. Determinations were made with lithopone of direct solar and diffuse skyshine on 14 " clear " days in October and November, 1927. The results are tabulated in Table VII.

TABLE VII

DETERMINATION OF SKYSHINE VERSUS DIRECT SUNSHINE

	Sun	Sky
14 determinations	0.13– 0.33	0.13– 0.25
Average	0.284	0.199

Thus, the skyshine constitutes 70 per cent of the direct solar ultra-violet light, a good confirmation of the figure reported by Tisdall and Brown[18] in Toronto of about 50–67 per cent.

SUMMARY AND CONCLUSIONS

Solar ultra-violet light has been measured by the lithopone method and checked by three other chemical methods. Dust-cups and konimeter measurements of atmospheric pollution indicated that this was heaviest in the center of the city and fell off to approximately one-sixth as much in the country. Contrariwise, the amount of ultra-violet light in the country was 50 per cent greater than in the city. In parallel with this, it was found that the amount of settled dust on the top of a tall city building was materially less than at street level, while the incidence of solar ultra-violet light on the building was greater than at street level. Measurements made on " clear " days showed somewhat greater incidence of ultra-violet light than on cloudy days. The passage of ultra-violet light through confined air artificially polluted with fuller's earth, street sweepings and lamp black, respectively, shows that they are increasingly effective in the order mentioned in occluding solar ultra-violet light. Skyshine yields about 70 per cent of the amount of ultra-violet light received by direct sunlight.

From this study, we conclude that:

1. The lithopone method is dependable for field use in measuring solar ultra-violet light.

2. The belief that atmospheric pollution actually occludes ultra-violet light to a very great extent is well founded.

3. The constituents of atmospheric pollution in summer are greater in quantity and different from those in winter.

4. Skyshine is equivalent to about 70 per cent direct sunshine in content of ultra-violet light.

5. Carbon as tarry products is materially more inhibitive to the incidence of ultra-violet light than siliceous materials.

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Public Health and the Public Purse[1]

TO have their good deeds interred with their bones is the common lot of sanitary reformers: an unmindful public gives little heed to disasters which would have been. The achievements in diminished mortality in fevers in a period of 70 years following the initiation of sanitary legislation in England in 1848 were summarized by Sir William Hunter. He pointed out that if the rate of mortality which existed in England and Wales for the years 1847–1850 were applied to the 4 years 1916–1919, the following would be the position:

Typhus would have killed 100,000, whereas the actual number of deaths was 7.
Typhoid would have killed 70,000, whereas the actual number of deaths was 3,626.
Cholera would have killed 114,000, instead of which there were no deaths from cholera for 30 years.
Smallpox would have killed 42,000, whereas the actual number of deaths was 110.
Scarlet fever would have killed 122,000, whereas the actual number of deaths was 5,390.
Diphtheria would have killed 30,000, whereas the actual number of deaths was 19,631.
Measles would have killed 56,000, whereas the actual number of deaths was 29,272.
Whooping cough would have killed 66,000, whereas the actual number of deaths was 23,087.

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Medical and Public Health Work in a Large Coal Company*

DANIEL J. KINDEL, M. D.

Medical Director, The Consolidation Coal Company, Inc., Fairmount, W. Va.

THIS paper is a brief report of the work of our organization as it has been carried on for the past year or more by The Consolidation Coal Company, Inc., one of the largest producers of bituminous coal in the United States.

For a number of years physicians have been employed on a contract basis. Each employee contributed a stated amount monthly toward his medical expenses, which was withheld from his wages and paid to a designated physician. Obstetrical, surgical, and venereal disease cases were charged for in addition, and a wide variety of such fees existed. The physicians were chosen by mine superintendents, other officials, or by the people themselves. One physician usually served several communities of the same company and frequently those of other companies. He would necessarily sublet some of his work. This had its undesirable features.

Slightly more than a year ago there were approximately 35 physicians employed by our company on this basis, each independent of the others, without coördination and coöperation. No definite plan of work existed; methods and equipment were not standardized; and a great deal of the practice of medicine was on a pill dispensing basis. Records were inadequate, and an organized health program was lacking.

Nurses administered to the sick and injured in the homes; assisted with the household duties; and filled in wherever they were needed.

Many of the physicians and nurses deserve great praise for their work, as at times it was very rigorous and pioneering. Transportation facilities were very poor and inadequate, living conditions bad, and many unreasonable demands were made. With improved highways, living conditions, state and county health programs, educational work, and a direct interest on the part of the companies, there is a gradual transition to a new mode.

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* Read before the Industrial Hygiene Section of The American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

FUNDAMENTAL FACTORS OF OUR MEDICAL PROGRAM

Our main problem is to provide medical and nursing service for 10,000 employees and their families. Our operations extend into 4 states—Kentucky, West Virginia, Pennsylvania and Maryland—with 6 divisions, the minimum distance between any 2 being approximately 60, and the maximum 300 or more miles. One division covers 30 miles and our communities are widely separated.

The scattered locations of our employees and communities make it difficult at times to carry on our program, as we cannot centralize our medical and nursing work. This has resulted in the establishment of areas or " medical units," based upon location and number of employees, each in charge of a physician and a public health nurse. Usually there is one full-time physician to a unit but in several instances two are required. At present there are 13 units, in the charge of 18 full-time physicians. Employees receive all usual medical attention, including minor surgery. Hospital service is given by private or state institutions, with the exception of one division where we operate our own 50-bed hospital.

Employees contribute on a monthly basis, and no charge is made for treatment, drugs, dressing or other materials, but $20.00 is allowed the physician in obstetrical cases, and small fees in venereal diseases.

The executives of the company, realizing the possibilities of an organized medical department, made a survey of the medical, hospital, nursing and sanitation problems of all its properties in 1926 and the early part of 1927. The present program had its inception about July 1, 1927.

Staff and Personnel—Our personnel consists of 18 full-time physicians in charge of 13 medical units, a chief hospital surgeon, an assistant, a full-time laboratory physician, 6 dentists, a supervisor of public health nurses, 11 full-time public health nurses, and 8 hospital nurses. During the past year we have reduced our staff of physicians from approximately 35 to 18, replacing part-time by full-time men. Under the direction of the supervisor, the public health nurses are conducting a well rounded-out public health program, with the assistance of the physicians and other personnel.

The medical director is directly responsible for the activities of the doctors, nurses, hospital, etc., to the director of industrial relations who in turn is responsible to the vice-president of operations.

The Medical Program—The most important major phase consists in the care of injured and ill employees and their families. This includes visits to the home, and consultations and treatment in the medical unit. One of our greatest problems is to make patients come to

the doctor's office. Rather than go to the unit, the physician is often called to the home for very minor ailments, which is time consuming and annoying.

This is the only objection to the plan of monthly contributions by the employee, for some feel that the monthly sum they are paying entitles them to call the physician to the home for any cause.

We believe that a long established precedent in the coal field is responsible for this and are gradually overcoming it by an educational campaign through the doctors, nurses, personnel managers, operating officials and by group meetings between departments and staffs.

We have standardized equipment, instruments, drugs, and supplies, so that all units are practically the same, and we have attempted to impress our employees with the necessity and advisability of seeking relief here whenever possible, since they can be better taken care of where the facilities are available than in the home. Progress is slow, but there is a gradual improvement.

Dispensing of Drugs is the second major phase. Company employees attended by company physicians are provided with drugs, medicines, dressings and supplies without additional charge. A stock of the usual drugs and biologicals is kept at each medical unit, but patients may be requested to pay part or all of the actual cost of a special drug. A standardized drug list was determined on and each physician now requisitions his supply from this every 2 months. As a result considerable economies have been effected.

Clinics—At the clinics conducted by the company nurses, more than 7,000 individuals, mostly children, were examined by physicians and dentists during the first 8 months of 1928. This is a small beginning but represents progress.

Immunizations—While a number of immunizations have been given during the past 8 months, this activity is still in its inception, and for the present will be confined to localities where the prevalence of disease justifies it.

There were 9,947 immunizations against typhoid fever. Approximately 9,500, or 95 per cent of several communities, were immunized through compulsion, because typhoid fever was prevalent in 1927 (45 cases with 3 deaths). Only 2 cases have been reported in 1928, 1 in a person from another locality, and 1 who had not been immunized. There were 5,376 smallpox vaccinations and 1,885 toxin-antitoxin immunizations.

Daily Medical Reports—Each physician is required to make a daily medical report which covers the cases seen each day. This was primarily intended as a record of the prevalence and character of dis-

ease in our communities, with age, color and sex of those affected. A diagnosis is made if possible; otherwise the patient's chief complaint is given. A record is kept of new and return cases and of those injured in their work. This report is available to the nurse for selection of special cases. The physician indicates those he wishes her to attend. These reports are checked and summarized monthly. Persons consult our physicians for headaches, colds, constipation and other minor ailments since fees are not charged. In this way many ailments are seen which would otherwise escape attention. Only a beginning has been made, but we believe that we are making the first controlled morbidity study of an entire industrial population, numbering between 40,000 and 50,000, of all ages, nationalities and both sexes.

TABLE I

QUANTITATIVE SUMMARY OF DAILY MEDICAL REPORTS OF THE CONSOLIDATION COAL COMPANY, INC., 1928 COVERING A 5-MONTHS PERIOD

Total Calls	52,046
House Calls	14,277
Office Calls	37,378
House and Office Calls	391
Colored	6,787
White	45,259
Males	29,092
Females	22,954
Average Calls per Day	24.96
Number of Physicians Reporting	16

Table I is a summary of 5 months' work. Our employees are receiving $2.00 worth of service for every dollar paid in. The average cost per family for the usual medical attention, excluding hospitals, is approximately $36.00 per year, for which they actually pay $18.00.

Compensation Injuries—Another phase of our medical program is the care and treatment of compensable injuries, which require 1,100 to 1,300 services per month, approximately one-fourth being first treatments.

We have recently instituted the "Return-to-Work" certificate, which an employee must receive before he may return to work after an accident or long illness. The purpose is to decrease absenteeism, avoid risk, regulate compensation, and obtain data as to time lost due to injury.

Another phase of our medical program is the employment of dentists. At present we have agreements with 6 dentists, under which the company provides the location and makes collections over the pay rolls for services in accordance with a standard list of charges. The dentist agrees to adhere to these fees, extract all deciduous teeth free of charge, and perform all ordinary maintenance work for children

under 15 years of age at half price. Each child is to receive a dental examination at least once during the school year. A record is kept and follow-up work is done.

Most tonsillectomies are done by our company physicians, and a charge of $20.00 is made. Each individual is required to pay all or part of this fee, as determined by a committee, consisting of the public health nurse, the personnel manager, the mine superintendent and the auditor. If the report of the committee justifies free operation, no fee is charged.

Other special clinics, such as eye refractions and orthopedic corrections, are conducted in a similar manner, except that specialists are called in and the amount a patient cannot pay is either taken from a company charity fund or provided for by state and county funds, or such organizations as the Rotary Club, Kiwanis and similar organizations.

It is part of the duties of the physician and nurse to keep a check upon the sanitary conditions of the communities in which they work, reporting those which are a menace to health to the proper authority for correction.

Housing and Civic Improvement Department—The company has a well organized department of housing and civic improvement which has direct supervision over buildings, grounds, sanitation, etc., and cooperates with the staff of the medical department in the establishment of proper sanitary conditions.

This department maintains regular garbage and refuse collections, disinfects houses, sees to the construction and cleaning of vaults and excreta disposal, maintains the water and sewerage systems, and the cleanliness of the communities.

Laboratory—A clinical, pathological and bacteriological laboratory has recently been established, intended to serve all divisions for water and milk analyses. Physicians of our company, as well as others, may send specimens for examination, a charge being made to non-company doctors.

The Nursing Program—Our public health nursing program is divided into 10 heads:

1. Bedside
2. Prenatal
3. Maternity
4. Infant Welfare
5. Child Welfare (preschool)
6. School
7. Tuberculosis
8. Communicable Disease
9. Social Service
10. Educational

These titles indicate the type of work included in the 10 divisions. In the 8 months under consideration, 16,398 services have been ren-

dered, to which might justly be added correction of defects, attendance on clinics, weighing of children, etc., which were the direct outcome of instructions given by nurses in the course of their work.

CONCLUSION

We have given you a summary of the work of this company, and in conclusion wish to state that we have attempted to organize our medical and public health program on a sound and workable basis, one which possesses elasticity to meet our needs and also one from which we believe the employees and the company as a whole will derive the most benefit.

Sick Insurance for Airplane Workers

COMPULSORY insurance against sickness is established in Italy by a law of January 10, 1929, for persons employed on all non-military vessels and airships. The insured persons are entitled to free medical and surgical aid, including hospital care, and to a cash benefit equal to 60 per cent of their wages. The insured women are also entitled in case of confinement to obstetrical aid and to a cash benefit payable for 12 weeks, and longer if they are unable to resume their work; the wives of insured men are given obstetrical treatment. Free medical aid is also given to the members of the insured person's family.

In case of the insured person's death his wife or children are paid an amount equal to 1 month's wages. The funds necessary for the administration of this law are to be derived from contributions by the employers and the workers.—*Gazzetta Ufficiale,* Rome, Feb. 8, 1929, p. 619.

Strength and Weaknesses of County Health Organization*

MILFORD E. BARNES, M. D., DR. P. H.

Director, Ohio Training Station for Health Officers, Greenville, O.

THE executive head of any department of health carries grave responsibility. It is his duty to safeguard the health of the people under his jurisdiction. The field has expanded materially during the last half century, and it is probable that it will continue to expand.

The problems of preventive medicine have been simplified so far as knowledge goes, but administration is more complex. The practice of public health requires detailed knowledge of preventive medicine, and also familiarity with matters entirely alien to the medical curriculum. The modern practitioner of public health must specialize.

Public health work is vitally concerned with individuals, in so far as they may affect the health of the general public. The control of disease involves invasion of the home and privacy of individuals, which is diametrically opposed to the traditional spirit of the American people. A typhoid fever outbreak may involve the search for carriers, and the restriction of their occupation. Effective milk control, and the provisions of the Shepherd-Towner act require intimate acquaintance with the private affairs of individuals. In one state, the health officer is not only authorized, but directed, to make an examination of any person who has, or is reasonably suspected of having, venereal disease. Such a provision involves intrusion into private affairs to the utmost degree.

We must remember that official health agencies derive their financial support from public funds. The broad general principle that funds for local developments should be collected locally applies to health work as well as to other projects. It is unfair to use state taxes for the benefit of selected counties; to tax a county for the benefit of one or more of its cities; or the rural population for the benefit of the incorporated towns. Public health work, if it is to be supported from public funds, must be developed on a basis which,

* Read before the Health Officers Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

so far as possible, will benefit equally *all* of the people taxed. This carries the corollary that public interest must be developed in the proposed work. Without it local taxes cannot be assessed or collected.

The complexity of modern health work, the need for specially trained personnel, for intimate contact with the people, the obligation to give service for the equal benefit of those concerned, and the necessity for developing local interest to support tax levies—all indicate that the ultimate unit of health organization must be local, if it is to be adequate and enduring. The unit of operation must be large enough to provide funds sufficient to employ trained personnel, and to support the work conducted under its direction. It must be small enough to allow the establishment of friendly relationships with the people of the community, equal distribution of services, and the development of local interest.

Except in the case of very small states, these considerations would reduce the size of the field units to the county, city, township, or town. Cities of sufficient size can, and often do, support their own health departments. In operation, however, no city department can confine its interests to the corporation limits; for example, in milk control, meat inspection, sewage disposal, and water supplies, unless the outlying districts are under adequate health service. The township and small town are generally too small to support the work required of a modern health department.

The county, on the other hand, offers such advantages that in many states it has been chosen as the base for local health administration. It is timely to consider the strength and the weaknesses inherent in this plan of organization.

ELEMENTS OF STRENGTH

1. The county is the largest unit of purely local government. Other activities based upon this unit have long been recognized and accepted—there are county commissioners, financial officers, courts and officers of justice, superintendents of schools, and agricultural agents. It would therefore involve no radical departure if there should be a county department of health, but put such work on a par with other important agencies.

2. Being a legally defined governmental unit, the county is a unit for taxation purposes, with an established system for collecting and handling tax funds and apportioning assessments. The collection of a special assessment for health work, or the allocation of funds offers no special difficulties.

Although counties vary markedly in wealth, as a rule sufficient funds for the maintenance of a full-time health department can be raised without undue burden upon the taxpayer. The expenditures for health in the county with which the writer is connected amounted in 1927 to $18,107.35, or 43 cents per capita, which maintained a full-time staff of 8 members. The budget for 1928 totals $21,950.00, or approximately 51 cents per capita, including all subsidies. In the first 7 months of 1928, 17,509 services were rendered. These included the handling of 995 cases of reportable disease, 4,993 sanitary inspections, and 11,063 services by the public health nursing division, among which were 3,755 home calls, including 140 prenatal, 100 maternity, 708 infant welfare, 387 child welfare, 320 tuberculosis or tuberculosis contacts, 172 orthopedic, and 255 calls upon physicians in behalf of patients. The year's services will approximate 30,000.

This type of record can be duplicated in dozens of counties, and is cited as a concrete example of what can be done on a very reasonable per capita levy. In several of the southern states effective work is conducted on a much smaller budget, through the employment of units of smaller size. The extent of the work will necessarily be limited by the money available; but effective work is usually possible under a budget within the financial ability of the average county.

3. The average county is of a convenient size for one unit of staff to handle. Personal contacts can be established which permit even those activities which involve intrusion into private affairs. A fairly equal distribution of services is possible over an entire county, both urban and rural. In the county referred to, one-third of the home calls were made among the rural inhabitants, who comprise 62 per cent of the population, and probably one-half of the services have been directly for their benefit. Under no other system can rural districts share to such an extent in the benefits of organized health work.

4. The county system is advantageous over smaller areas in the handling of such matters as control of communicable disease, disposal of sewage, development of pure water and milk supplies, and prevention of stream pollution—all of which extend beyond legal boundaries.

5. Finally, as the county is a local area so far as government is concerned, popular interest in health work can be developed and capitalized, and coördination of county-wide private agencies interested in limited phases of health activities secured.

INHERENT ELEMENTS OF WEAKNESS

1. Vulnerability to political influence, which it shares with every other agency supported by public funds. The sinister influence of

politics is felt in every activity which involves important interests. Securing of sewage disposal plants, safeguarding of milk supplies, and food inspection, frequently involve financial loss to individuals; so there is almost sure to be a certain amount of opposition to such measures. It takes courage to work for measures designed for the public good in the face of opposition. Many a health officer is held back by the fear that his whole program will be jeopardized if he carries out his duties fully.

Specific instances can be cited illustrative of this point. A city passes regulations establishing certain minimum requirements as to milk, then proceeds to ignore them. An influential establishment maintains a malodorous plant which arouses bitter criticism on the part of neighboring citizens; yet for 10 years nothing is done to abate the nuisance. A judge or a lawyer owns houses and refuses to make sewer connections. A city pours its untreated sewage into a small creek in spite of the protests of riparian landowners. Many specious reasons can be advanced in extenuation of such conditions; but the real reason lies in politics. Boards of health do not feel that it is expedient to take the action which all admit is indicated. In numerous counties this sinister influence extends even to the appointment of members of the staff. Many health officers are handicapped by employees whose dismissal they are powerless to effect, because the storm which would follow, being localized, is likely to be violent.

Happily, with the increasing employment of well trained workers, the public is coming to appreciate the fact that health work is above politics, and, as between the advocate of special privilege and the conscientious health officer, its best interests lie in backing the department of health.

2. There are differences in practices prevailing among county health organizations. In the county system, the principle of decentralization is followed, and responsibility is placed upon the county officers, who carry out their programs according to their knowledge and ability, as affected by local conditions.

It is obvious that a health officer who is a political timeserver has little interest in any activity which jeopardizes his position, and that the untrained man will work less effectively than the trained. The result is great disparity in the effectiveness and nature of the work attempted. The solution will be expedited by greater supervision on the part of state departments of health.

However, the same disparity obtains as between state and city departments of health. One has but to scan the pages of *Municipal Health Practice for the Year 1923*,[1] based upon a study of 100 of the

largest cities in the United States, to see the chaotic condition which prevails in health practices. For example, scarlet fever has long been classified as a communicable disease. If isolation of cases is justifiable, it must be based upon scientific observations. Presumably such observations as to duration of transmissibility are valid regardless of location. Why, then, do isolation periods vary from 21 to 35 days, depending upon the residence of the patient? The absurdity of this situation is illustrated along the Ohio-Indiana boundary where families living on opposite sides of the same road have been placarded for periods of 30 and 21 days, respectively. It cannot be maintained that the boundary line has any influence upon the duration of the infective state.

Surely the time has come when health measures which are basically sound can be made more nearly uniform. Interstate agreements, and greater supervision over the county health services will be necessary to bring this about.

3. The county is too small for the proper handling of numerous important problems. If there were uniformity of practice among the counties, this would not be so serious. A county health officer found a case of typhoid fever on a dairy farm and he promptly stopped the sale of the milk in his own county; but the producer shipped it into the adjoining county. Several days later this came to the notice of the officer of the second county, who had to make a trip of 30 miles beyond his borders to protect his county. The probability is that the producer shipped into a third area, with no one the wiser. One county refuses a permit for the production of milk for sale in the county because of the bad state of the barn and the uncleanly manner in which the milk is handled. This is of no effect if, as at present, the producer can ship into a city with even more stringent regulations but not enforced. In the control of epidemics, and safeguarding of water supplies, the county is too small a unit, and state action appears to be absolutely necessary.

4. Being a local organization, it shares in the effects of intertown rivalry, in any antipathy between the rural and urban populations, in the outcry against increased taxation, in the vociferous opposition of individuals who develop personal dislikes toward members of the staff, in the whispering campaigns which abound in every small community. The only solution is the conscientious discharge of duty, exercise of patience and tact, constant effort to develop a public conscience as to public health, and the saving grace of humor.

In conclusion it may be pointed out that the strength inherent in county health organization far outweighs the weaknesses. There are

some counties too large for any single unit to handle satisfactorily, and others too small or too poor to permit the raising of the required funds. In some the roads make it impossible to distribute the services with any degree of uniformity. It is evident that such counties will require special adaptations to meet their several conditions. In the vast majority of the counties in this country, however, it would appear that adequate health work is possible of realization based primarily upon local support.

SUMMARY

1. Health work must be organized on a local basis to be adequate and enduring.
2. The elements of strength inherent in county health organization are:

   The county is the largest unit of local government; and offers precedents for such organization.
   It is a taxation unit, of sufficient resources to insure adequate funds.
   It is of a convenient size for one unit to handle.
   It offers advantages over smaller units in the handling of various health problems.
   It permits the development and capitalization of local interest in health work.
3. The weaknesses are:

   Vulnerability to political interference.
   Divergence of health practices.
   Being too small an area for handling certain important health problems.
   As a local organization, it is subject to strictures arising from provincialism.

REFERENCE

1. *Pub. Health Bull., 164,* July, 1926.

NOTE: The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation.

Carriers

THE New York State Department of Health has reported the discovery in 1928 in the upper part of the state, of 23 typhoid carriers—a total of 167 known, exclusive of those in state institutions. Forty-eight cases of typhoid fever were traced to these newly discovered carriers, who ranged in age from 15 to 68. Female carriers predominated, approximately 4 to 1. In all but 1 case, there was a history of a previous attack of typhoid fever. In 1, 37 years had elapsed, indicating the persistence of the carrier state over a long period. In 7, gall bladder operations were done with complete success, as indicated by laboratory examinations. These were released from restrictions.

Stability of Commercial Sterilizers in the Presence of Milk

G. N. QUAM AND SIDNEY N. QUAM

Long Island University, Brooklyn, N. Y.; and Sugar Creek Creamery Co., Danville, Ill.

DUE to the increasing popularity of chemical sterilizers, much has been written concerning the uses of the hypochlorite and organic chlorine containing preparations. Those containing sodium hypochlorite seem to be most favored by the dairy and bottling industries. The so-called sodium hypochlorite sterilizers have neither the same composition nor the same degree of activity or stability. It is well known among chemists that the addition of sodium hydroxide to a sodium hypochlorite solution increases its stability to a marked degree. Some of the sodium hypochlorites on the market owe their stability to the high sodium hydroxide content; a notable example being antiformin.[1] One of the authors[2] observed that the stability of dilute solutions of sodium hypochlorite in the presence of metals could be greatly increased by the addition of less than 1 per cent of sodium hydroxide, tri-sodium phosphate or calcium hydroxide. The great stability of some of the commercial products is no doubt due to the addition of such compounds in excess during the manufacturing process, for their cleansing action, or to increase the chlorine capacity. R. L. Wells[3] found that the deterioration of the strong hypochlorite solution at room temperature varied greatly with the difference in composition, and that various salts may act as retarders or accelerators.

The stability of the sterilizer under plant conditions has received some attention. Levine, Toulouse, Peterson and Buchanan[4] found that a standard hypochlorite solution in distilled water suffered practically no loss, while with the addition of 1 per cent corn sugar there was a drop of about 67 per cent in the available chlorine in 1 hour at 79° F. Cane sugar was far less destructive.

In a study of the action of rubber on a commercial hypochlorite one of the authors[5] found that in 8 hours the hypochlorite suffered a 95.38 per cent loss of available chlorine, while in a so-called alkaline sodium hypochlorite a loss of but 80.4 per cent was noted.

Unlike the hypochlorites, the organic chlorine containing sterilizers, such as chloramine-T, are unusually stable. Leach[6] found that all the American made chloramine-T, dichloramine-T and other prep-

arations, were very stable, and their activity was greatly lessened by the slight increase of alkalinity.

The fact that in the dairy industry, sterilizers may come in contact with milk and milk products during their legitimate use seemed to warrant a systematic study of the effect of whole milk on the stability of commercial sterilizers.

REPORT OF EXPERIMENTS

The commercial sterilizers used are indicated by the numbers I, II, III and IV. I is a liquid sodium hypochlorite preparation, strongly alkaline with sodium hydroxide; II a liquid sodium hypochlorite; III a crystalline tri-sodium phosphate sodium hypochlorite preparation; and IV a chloramine-T preparation. Each sterilizer was diluted to a concentration equivalent to approximately 200 p.p.m. available chlorine.

For a series of determinations at a given temperature 500 c.c. portions were placed in sterile flasks partially immersed in a constant temperature bath; 1 c.c. of whole milk was added to each; and at definite time intervals determinations of the available chlorine were made. The loss in available chlorine was calculated in terms of p.p.m. and recorded as in Table I.

The stability of IV was so great that data for it are given only at 109.4°, 123.8° and 145° F. In all cases, IV was unusually stable;

TABLE I

STABILITY OF STERILIZERS IN THE PRESENCE OF MILK AT DIFFERENT TEMPERATURES. LOSS EXPRESSED IN PARTS PER MILLION (P.P.M.) OF AVAILABLE CHLORINE. 1 C.C. MILK ADDED TO EACH 500 C.C. STERILIZER

		Loss in Available Chlorine		
Temperature	Sterilizer	½ hr. p.p.m.	1 hr. p.p.m.	1½ hr. p.p.m.
73.4° F.	I	31.2	40.8	50.7
	II	45.3	56.4	64.8
	III	45.3	56.4	66.2
91.4° F.	I	56.4	70.5	90.2
	II	64.8	81.7	93.0
	III	65.0	79.0	93.0
109.4° F.	I	68.0	100.1	—
	II	90.0	110.0	—
	III	95.1	111.0	—
	IV	15.5	16.9	—
123.8° F.	I	88.8	131.4	—
	II	112.0	132.0	—
	III	122.0	141.0	—
	IV	16.9	17.9	—
145° F.	I	152.0	183.3	186.0
	II	148.4	169.2	180.8
	III	161.4	183.2	184.7
	IV	30.3	35.2	39.4

though a decrease in stability with rise in temperature and extended exposure was noticeable. For each sterilizer a definite, uniform decrease in stability with increase of time for any given temperature was noticed. As the temperature increased the rate of deterioration was accelerated. The rate of deterioration was found to be specific for each sterilizer. The order of increasing rate of deterioration of the three sodium hypochlorite sterilizers was found to be I, II, III.

From observations within the range of temperatures studied, it appears that the change in rate of deterioration due to increase of temperature is progressive. The importance of maintaining relatively low temperatures during the sterilization of dairy plant equipment seems obvious.

The above data emphasize the fact that sodium hypochlorite sterilizers may vary greatly in stability and activity. The user cannot be too strongly urged to consider carefully the conditions under which the sterilizer is to be used, as well as the properties of the various commercial products.

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Publicity for Public Health

THE Illinois State Medical Society has upheld the action of the Chicago Medical Society in expelling Dr. Louis E. Schmidt. The charges on which this expulsion was based are " unethical advertising." It is reported that the action of both the Executive Council and the house of delegates of the state society was unanimous in its decision.

Dr. Schmidt had appealed from the action of the local medical society on the ground that it was not justified in holding him responsible for the advertising of the Chicago Public Health Institute, and furthermore that there was nothing unethical in the advertising of that organization.

It is expected that Dr. Schmidt will make a further appeal to the Judicial Council of the American Medical Association which will have to rule on the issue of whether it is ethical for the medical profession to advertise as a public health measure.

Rating Your Milk Supply

LEONARD V. PHELPS

Bacteriologist, Health Department, Bluefield, W. Va.

WITH the ever increasing use of the Standard Milk Ordinance of the U. S. Public Health Service, a corresponding increase has been made in the application of its scoring system to the milk supply of various communities.

The federal system divides the milk supply of the community into three parts for scoring purposes:

A. Retail raw milk
B. Raw milk to plants
C. Pasteurized milk

To each is given a total of 500 points, so distributed as to cover every phase of production, handling, etc., according to the importance of each phase. The division score is obtained by enumerating the number of points actually earned out of the total possible 500, and from that determining the percentage of the 500 points that this represents. Such a procedure gives the three division scores which are essential for the determination of the general rating of the milk supply.

The problem now is to give a general score or a general rating, as it will hereafter be referred to, which will show on the basis of the three divisional scores to what degree the community has been successful in properly producing and properly pasteurizing its milk supply.

Herein lies the reason for this article—because it is the opinion of the writer that a formula now in use by the U. S. Public Health Service does not show what it is intended to show, and in some instances gives a false picture as to the correctness of production and the degree of perfection of pasteurization of the milk supply.

The U. S. Public Health Service formula is as follows:

$$GR = \frac{C \times A\% + D \times B\% + E \times B\%}{2}$$

where:
A = Gallons retail raw milk sold per day.
B = Gallons pasteurized milk sold per day.
C = Retail raw milk rating.
D = Raw milk to plant rating.
E = Pasteurization process rating.
GR = General rating.

The U. S. Public Health Service has issued a statement along with this formula stating that, " A 100 per cent general rating means that all of the community's milk supply has been both properly produced and properly pasteurized."

This statement is true when the general rating is 100 per cent, but it can easily be shown that for values less than 100 per cent the general rating, hereafter referred to as the G. R., is often misleading. The G. R. could only have a value of 100 per cent if there were no retail raw milk sold, and the raw to plant, and the plant process scores were both 100 per cent. This would make it practically an impossibility for a community to get a G. R. of 100 per cent. When only a fraction of the milk supply has been pasteurized, the smaller the fraction, the less is the accuracy of the G. R. Most community milk supplies have a very low G. R., usually less than 50 per cent.

The G. R. can be increased or decreased as much as 35 per cent, when the A–B–C score is 90–80–80, simply by increasing or decreasing the percentage of the milk pasteurized, without regard to the methods of production or pasteurization. Obviously, such a G. R. is useless as far as it shows the grade of production and pasteurization.

CHART I

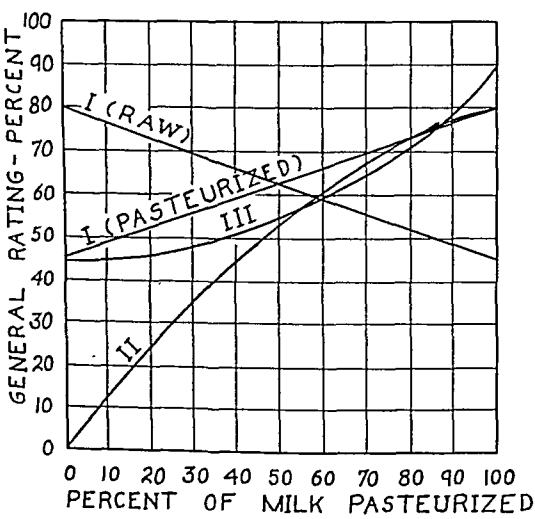
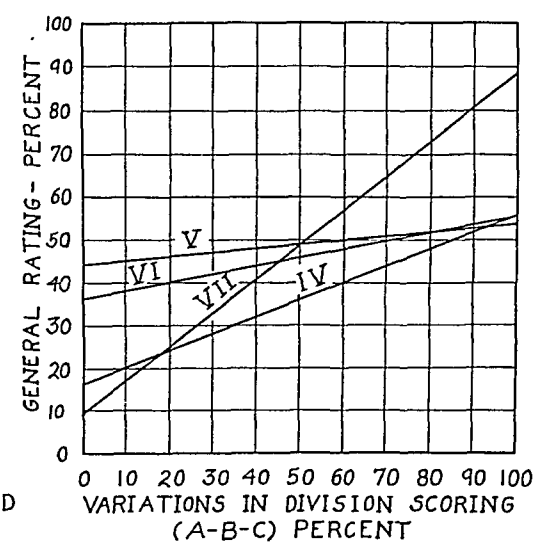


CHART II



I. Variation in per cent raw with constant A–B–C Score
I. Variation in per cent pasteurized with constant A–B–C Score
II. Variation in per cent pasteurized with A varying in the A–B–C Score
III. Variation in per cent pasteurized with B varying in the A–B–C Score
IV. Constant per cent pasteurized with A varying in the A–B–C Score
V. Constant per cent pasteurized with B varying in the A–B–C Score
VI. Constant per cent pasteurized (20 per cent) with B and C varying in the A–B–C Score
VII. Constant per cent pasteurized (80 per cent) with B and C varying in the A–B–C Score

Curve I (pasteurized), Chart I, shows the straight-line graph of increase in the G. R. when the percentage of milk pasteurized is regularly increased up to 100 per cent, and when the three division scores are 90–80–80. Hereafter the three division scores will be referred to as the A–B–C score. This curve shows an increase in the G. R. of 35 per cent. Curve I (raw) shows the opposite effect gained by increasing the percentage of raw milk in the community. It will be noticed that the G. R. regularly decreases as the percentage of raw milk increases up to 100 per cent.

In referring to the A–B–C score:

A = Retail raw milk score.
B = Raw to plant score.
C = Plant process score.

In all curves referred to hereafter the letters A, B and C are used as representing the A–B–C score apart from any system of notation used by the U. S. Public Health Service. An A–B–C score of 90–80–80 is used as representative of a very good score.

TABLE I

A–B–C Scoring	Per cent Pasteurized	Per cent Raw	General Rating
90–80–80	0.1	99.9	45.0
90–80–80	10.0	90.0	48.5
90–80–80	20.0	80.0	52.0
90–80–80	30.0	70.0	55.5
90–80–80	40.0	60.0	59.0
90–80–80	50.0	50.0	62.5
90–80–80	60.0	40.0	66.0
90–80–80	70.0	30.0	69.5
90–80–80	80.0	20.0	73.0
90–80–80	90.0	10.0	76.5
90–80–80	99.9	0.1	80.0

The general rating when the per cent of milk pasteurized is varied, the A–B–C score remaining constant.

Curves II through VII are of interest as showing something of the properties of the different quantities used in the U. S. Public Health Service formula for determining the G. R. They show that values of A are relatively unimportant compared to values of B and C, as far as their effect in increasing the G. R. is concerned, and that the chief factor in increasing the G. R. is the actual percentage of milk pasteurized in the community.

One can take an A–B–C score of 40–20–80 with the percentage of milk pasteurized as 20 per cent, and receive a G. R. of 26 per cent. Then simply by reducing the values of A and B one-half, giving an A–B–C score of 20–10–80, one can, by increasing the percentage of milk pasteurized 60 per cent, receive a G. R. of 38 per cent. In other words, it is possible in this instance to produce the community's milk supply only half as properly and yet receive a G. R. 12 per cent

TABLE II

A–B–C Scoring	Per cent Pasteurized	Per cent Raw	General Rating
40–20–80	20	80	26.0
20–10–80	80	20	38.0
80–60–80	20	80	46.0
40–30–80	80	20	48.0

This table shows that a milk supply having a production score (A–B) 50 per cent lower than another may receive a higher general rating simply by increasing the per cent of the milk supply pasteurized.

higher than before. Obviously a formula that will give such misleading values for G. R. is useless.

The second reason for this article is the suggestion of the use of another formula for determining the G. R.

Since the three A–B–C division scores were not affected by the amount of milk being pasteurized in the community, why is it necessary or logical to permit the G. R., which is a resultant of all three, to be affected by the percentage of milk pasteurized? If some other relationship were desired, it would be all right to consider the amount of milk being pasteurized, or any other value, for that matter; but we are interested in a general rating.

The G. R. is based on the A–B–C score. A 100 per cent G. R. should mean that all of the community's milk supply has been properly produced and that, if any of the milk is pasteurized, the process has been correct.

The objection might be raised at this time, and legitimately, to the use of the term " General Rating " in describing the result obtained by applying the U. S. Public Health Service formula to the community's milk supply. If the term is used, it should be qualified by some word showing it is really not a general rating but a " special rating," wherein pasteurization is stressed.

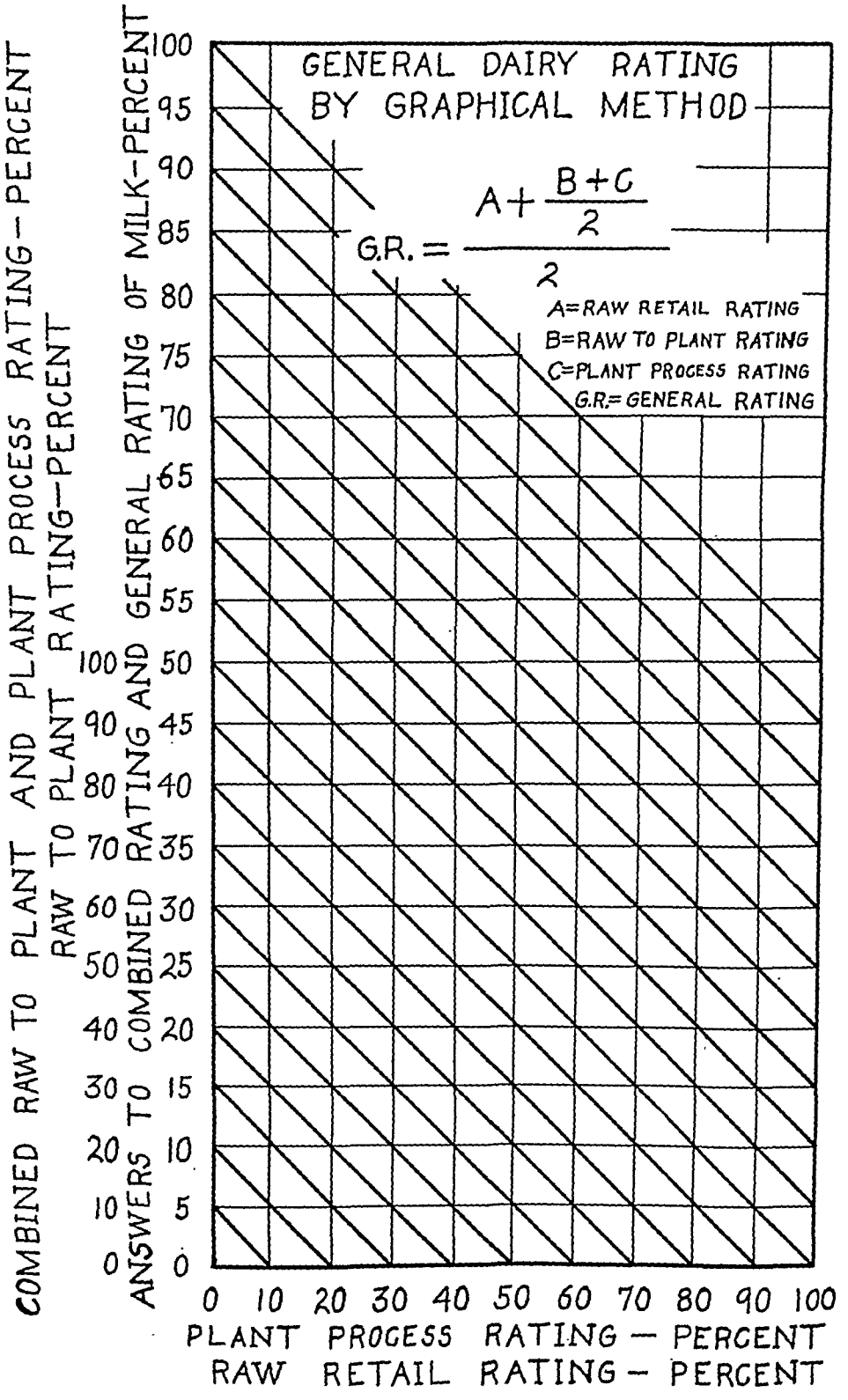
Two things are wanted by the dairy executive—the degree of compliance with the regulations as stated in the Standard Milk Ordinance, and the numerical figure showing how much of the community's milk is pasteurized. The G. R. should show the degree of compliance with the dairy regulations and only that. G. R. of 100 per cent should mean that 100 per cent of the regulations had been complied with.

TABLE III

City	Federal General Rating	General Rating New Method
A	53.1	70.7
B	50.5	72.5
C	45.7	73.7

This table shows that three cities, scored in 1928 by the U. S. Public Health Service rating formula, can be reversed in order of highest score by applying the new formula. This gives a truer picture of compliance with dairy regulations.

CHART III


GENERAL DAIRY RATING
BY GRAPHICAL METHOD
G.R. = A + (B+C)/2 / 2
A=RAW RETAIL RATING
B=RAW TO PLANT RATING
C=PLANT PROCESS RATING
G.R.=GENERAL RATING
COMBINED RAW TO PLANT AND PLANT PROCESS RATING—PERCENT
RAW TO PLANT RATING—PERCENT
ANSWERS TO COMBINED RATING AND GENERAL RATING OF MILK—PERCENT
0 10 20 30 40 50 60 70 80 90 100
PLANT PROCESS RATING — PERCENT
RAW RETAIL RATING — PERCENT

The following formula is suggested as one which will show the degree of compliance, one which will give a true, and not misleading, G. R.

$$GR = \frac{A + \frac{B + C}{2}}{2}$$

where: A = Raw to retail rating.
B = Raw to plant rating.
C = Plant process rating.
$\frac{B + C}{2}$ = Combined rating.
GR = General rating.

Three cities received a G. R. following an inspection by a federal officer. By applying the new formula, in which the percentage of milk being pasteurized has no effect, it was found necessary to reverse completely the order of cities (Table III) according to their G. R.

The third reason for this article is the suggestion of the use of a graphical chart for the solution of problems, given the A–B–C scores, to determine the G. R. The use of the chart will, where much statistical or comparative work is done, eliminate the tiresome arithmetical work. The directions for using Chart III are as follows:

TO DETERMINE COMBINED (RAW TO PLANT AND PLANT PROCESS) RATING

A. Read up left hand edge of chart and find line corresponding to raw to plant rating, which is outside line of figures.

B. Read across bottom edge of chart and find line corresponding to plant process rating.

C. Put a pinpoint where these two lines meet.

D. If it is on a diagonal line, the figure at the end of the line will indicate the combined rating, namely one-half of B plus C.

E. If the pinpoint is between diagonals, its distance from the diagonal line will indicate the fraction.

Example: Raw to plant rating ..... 61 per cent
Plant process rating ..... 53 per cent

The pinpoint comes between diagonal lines 55 per cent and 60 per cent. Answer is 57 per cent combined rating.

TO DETERMINE GENERAL RATING

A. Read up left hand edge of chart and find line corresponding to combined rating, which is outside line of figures.

B. Read across bottom edge of chart and find line corresponding to raw retail rating.

C. Put a pinpoint where these two lines meet.

D. If it is on a diagonal line, the figure at the end of the line will indicate the

general rating, namely one-half of the sum of the combined rating added to the retail raw rating.

E. If the pinpoint is between diagonals, its distance from the diagonal line will indicate the fraction.

Example: Combined rating ..... 57 per cent
Raw retail rating ..... 83 per cent

The pinpoint comes on diagonal line 70 per cent. Answer, general dairy rating is 70 per cent.

CONCLUSIONS

1. The federal general rating formula is too inaccurate and misleading to justify a continuance of its use.

2. A general rating should be based on the following only, without regard to the percentage of milk pasteurized:

Retail raw score
Raw to plant score
Plant process score

3. A general rating should show the degree with which the community complies with the regulations in the Standard Milk Ordinance.

RECOMMENDATIONS

1. That the use of the federal formula be discontinued.

2. That if the federal formula is retained, the resulting general rating shall be labelled something other than general rating, in order that it may be distinguished from a true general rating.

3. That a formula be used for determining the general rating which shall not involve the use of the percentage of milk being pasteurized.

4. That a formula shall be used that will show the degree to which the community complies with the regulations of the Standard Milk Ordinance.

NOTE: The writer wishes it distinctly understood that this article is in no sense an attack, personal or otherwise, on the U. S. Public Health Service.

Antituberculosis Vaccination in Italy

THE National Children's Bureau of Italy plans to introduce in 10 large cities optional antituberculosis vaccination of new-born infants.

According to the plan, the registrar of vital statistics in each city will report the births every day to the pediatric clinic of that city. The clinic will then send to the family a circular, with a reply card attached, explaining in simple language the reasons in favor of antituberculosis vaccination in cases where the child was exposed to contagion. If the parents agree, the child is given the vaccine. From that time on the child will be under the supervision of the clinic as long as this is considered necessary for its health.

The purpose of the work is to reduce the incidence of tuberculosis among infants and to ascertain more about the nature of the vaccine.

Sterilization of Milk Bottles in Soaker Type Washers*

LEWIS SHERE AND GERALD L. HOEFT

Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

THE proper cleansing and sterilization † of milk bottles is receiving increased consideration by health authorities and is important in building up public confidence in the safety and healthfulness of milk as a food. Cleanliness and a reasonable degree of sterility of all equipment with which milk comes in contact is a prime requisite.

A tabulation of published reports of diseases traced to milk and milk products, by Armstrong and Parran,[1] shows 45 instances where infection of milk bottles has been reported as the factor causing the outbreak.

The Department of Health of Chicago in its supervision and control of milk bottle washing follows essentially the recommendations of the laboratory advisory board. These recommendations were formulated in 1926, after a preliminary field study made by the Bureau of Laboratories and Research.

In laying down basic principles for adapting mechanical and bactericidal methods to milk bottle washing, the board took the position that milk bottles, because of their extensive and constant contact with the general population, must be regarded as one of the most important potential factors in the spread of disease through milk supplies.

The primary objective, therefore, of regulations for the cleansing and sterilizing of milk bottles is the prevention of the spread of disease through milk.

The board was of the opinion that the destruction of the common pathogens which may be present in milk can be best assured by applying heat in excess of the known thermal death points of these organisms in milk at some time during the washing process. Recognizing that practical difficulties are encountered in applying this degree of heat consistently under all conditions, the board also ap-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 16, 1928.

† "Sterilization" as used in this article refers to disinfection rather than sterilization in the exact scientific sense.

proved the use of chlorine in the free or available state as an alternative in disinfection.

The board made the following recommendations:

1. That milk bottles be washed by soaking or agitation in a solution of free alkali, or other effective cleansing agent, in such a manner as to remove all visible foreign matter

2. That a dual temperature standard be set for washing milk bottles:

a. *Soaker method*—Exposure during the soaking, washing or rinsing process to a temperature of not less than 165° F. for 5 minutes

b. *Steam jet method*—Exposure during the process to a temperature of not less than 195° F. momentarily

3. That milk bottles washed at temperatures below those specified be subjected to a rinse of a chlorine disinfectant solution in a concentration of not less than 35 p.p.m. of available chlorine

4. That a bacterial count standard of not to exceed 1 per 2 c.c. of capacity be applied to milk bottles when the washing process is completed

In 1924, Whittaker, Archibald and Shere reported on the relative efficiency of sterilizing milk bottles by hand operated and hydraulic type bottle washers. It seemed desirable to make similar studies of the soaker type of washers now in use in Chicago and being installed in milk bottling plants, in order to test out the practicability of the advisory board's recommendations.

PROCEDURE

In these studies sample bottles were collected where possible at various stages during the cleansing and sterilizing processes, such as after soaking in caustic solution, after the brushing or pressure rinses, after plain rinsing and after sterilizing. The plating was done in the field within 5 minutes after the bottles were taken from the machine. As soon as a series of bottles was collected, the interior of each was rinsed with 20 c.c. of sterile water and the bacterial content was determined by the agar plate method as prescribed in the *Standard Methods of Milk Analysis,* American Public Health Association, 1927. From these results, the bacterial content per bottle was calculated by multiplying by 20.

In several tests, unwashed bottles were distinctively marked and contaminated heavily with a suspension of *B. coli;* these were placed in the bottle washer at the feed end and removed after passing through the soaker compartment. Marked, washed bottles were also contaminated in this manner and placed in the carriers just after emerging from the soaker solution and removed at the discharge end of the washer. Other marked bottles containing *B. coli* were inserted just before the bottles entered the final chlorine rinse. These bottles

immediately after removal were rinsed with 20 c.c. of sterile water and 1 c.c. planted in standard broth tubes and the presence of *B. coli* determined in accordance with *Standard Methods for the Examination of Water and Sewage,* American Public Health Association, 1925.

Nine different machines were tested at intervals over a period of 15 months. Bacterial counts were made on 1,885 bottles. Seven hundred and three additional bottles were tested also for the destruction of *B. coli.* During each test, determinations were made on the soaker solutions for carbonate and caustic alkalinity, also for residual chlorine in the sterilizing rinses. Temperature readings were made on soaker solutions and hot water rinses where used. The speed of operating each machine was determined. A study of the manufacturer's blue prints or cuts was made to determine the exact time of each stage of the process.

TABLE I

TREATMENTS TO WHICH BOTTLES WERE SUBJECT IN THE WASHERS TESTED

Machine	Pre-Rinse Seconds	Caustic Soak Min.	Caustic Rinses Tot. No.	Caustic Rinses Tot. Sec.	Brush and Plain Rinses Tot. No.	Brush and Plain Rinses Tot. Sec.	Steam Jets Tot. No.	Steam Jets Tot. Sec.	Tri-Sodium Phosphate Rinses No.	Tri-Sodium Phosphate Rinses Sec.	City Water Rinses No.	City Water Rinses Sec.	Chlorine Rinse Drain Tot. No.	Chlorine Rinse Drain Period Sec.	Chlorine Rinse Drain Tot. Sec.	Alkalinity Soaker Solution Carb. Per Cent	Alkalinity Soaker Solution Caustic Per Cent	Av. Temp. Soaker Solution ° F.	Chlorine Solution Av. P.P.M.
I	0	8.3	0	—	2	15	0	—	0	—	4	30	2	15	57	1.81	1.80	117	16.9
II	100	8.3	0	—	2	15	0	—	0	—	3	22	2	15	90	3.34	4.37	129	15
III	8	7.7	0	—	0	—	2	16	4	32	2	16	0	—	80	2.18	3.27	139	None used
IV	0	11.8	0	—	0	—	0	—	0	—	0	—	2	14	21	3.44	4.33	152	3.0
V	0	8.3	4	36	0	—	0	—	6	216	2	18	1	9	36	0.85	2.10	140	126.0
VI	105	6.0	6	90	0	—	0	—	0	—	3	45	2	30	135	0.80	1.80	140	40
VII	9	6.0	2	18	2	18	2	18	0	—	2	18	0	—	135	0.90	1.75	140	None used
VIII	0	20.0	0	—	0	—	0	—	0	—	5	40	0	—	88	1.60	2.10	153	None used
IX	0	10.6	3	33	0	—	0	—	0	—	3	33	1	11	99	0.89	1.40	119	17.4

The different treatments provided by the machines and length of time of each are given in Table I. The principal differences are in number of soaker compartments, whether soaking is followed by a pressure rinse of caustic solution or by brushing, whether final sterilization is provided by heat or chlorine, and in the length of time provided for the various operations. Variation will be noted also in the strength and average temperatures of the soaker solutions and the strength of chlorine solution.

RESULTS

The results of the bacteriological examination of the bottles collected at various stages in the machines are given in Table II under the headings " Average Counts," and " Per cent under 500."

Considering first the bottles collected as they emerged from the *soaker solution,* it will be noted that in one of the nine series, all of the bottles had counts under 500. The percentages on the other runs were: 99 (2), 96, 94 (2), 82, and 76.

TABLE II

RESULTS OF BACTERIOLOGICAL EXAMINATION OF MILK BOTTLES COLLECTED AFTER RECEIVING VARIOUS TREATMENTS* IN SOAKER TYPE BOTTLE WASHERS

Test Run No.	No. Bottles Tested	Soaker		*B. coli*		Caustic Rinse or Brush		Plain Rinse		Sterilized Bottles		*B. coli*	
		Per Cent under 500	Av. Count	No.	Results	Per Cent under 500	Av. Count	Per Cent under 500	Av. Count	Per Cent under 500	Av. Count	No.	Results
1	159	76	5,458	80	0	68	853	77	782	100	23	73†	0
2	480	100	35	96	0	94	149	83	230	99	21	96†	0
3	361	99	39	—	-	100	14	100	21	99	43	—	-
4	450	99	59	—	-	—	—	—	—	97	155	—	-
5	68	94	120	45	0	—	—	—	—	100	25	45‡	0
6	71	—	—	—	-	—	—	—	—	100	30	—	-
7	69	82	364	44	0	—	—	—	—	100	21	44‡	0
8	149	96	93	48	0	—	—	—	—	100	29	48‡	0
9	78	94	59	44	0	100	11	—	—	100	14	40‡	0

* Where no samples are shown the construction of machine rendered it impractical to collect bottles at these points.

† *B. coli* contaminated bottles placed in machine to receive chlorine rinses only.

‡ *B. coli* contaminated bottles placed in machine to receive all treatments except soaking.

Considering the bottles as delivered by the machine after soaking, rinsing and sterilizing, in six of the nine series all of the bottles had counts under 500; two, 99 per cent; and one, 97 per cent. These results were considered as satisfactory compliance with the bacterial count standard recommended by the advisory board.

All bottles contaminated with *B. coli* gave negative results after being subjected to soaking or rinsing and sterilizing.

CONCLUSIONS

Field tests and observations revealed that all of the types of soaker bottle washers now in use have either provided, or can readily provide, for sterilization in a manner meeting the recommended standards, namely: exposure to 165° F. for 5 minutes, or 195° F. momentarily; or rinsing in a solution of chlorine disinfectant in a concentration of not less than 35 p.p.m. of available chlorine.

In certain instances, these observations further showed the necessity of improved plant control to make sure that the standards would be properly met. Therefore, on machines providing heat sterilization the installation of temperature control apparatus was recommended and secured; on machines providing chlorine sterilization, the plants were required to provide orthotoluidine testing kits, and the bottle washer operators were instructed to check the available chlorine at frequent intervals to assure proper dosage at all times.

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Detergent Properties of Alkaline Dairy Washing Compounds*

MILTON E. PARKER

Formerly Dairy Technologist, Philadelphia Dairy Products Co., Inc., Philadelphia, Pa.

TO quote that modern classic *Fundamentals of Dairy Science:*[5] "While dairy utensils are in no sense a natural habitat of bacteria, a great many organisms grow on the surfaces of such equipment so that the utensils form an important source of bacteria in milk. As a general rule, in fact, under ordinary farm conditions where steam is not available for sterilizing purposes, more bacteria gain access to milk through utensils than from any other sources." These conclusions can truthfully be supplemented with the observation that the farmer is not the only offender in this matter.

Some of the present methods of dairy sanitation fail to give cleanliness consistent with quality standards. Cleanliness is the exception and not the rule. The presence of oily films in pipe lines, utensils, pasteurizers, holding and mixing tanks, valves and the like, can readily be detected by the finger. Wherever intense heat (particularly steam) is applied to any surface in contact with milk for an appreciable period of time, a calcareous deposit known as "milk stone" forms, which continued applications of some washing compounds fail to remove. Such surfaces are not clean and can be the sources of trouble because they provide culture medium for bacteria which may gain access between the washing and sterilizing and the passage of fresh milk.

When such conditions become troublesome, it is sometimes the practice to apply copious amounts of some chlorine disinfectant, which may be antiseptic for short periods but never germicidal, since their disinfecting properties are destroyed through chemical combination with the adhering milk solids, and the condition remains to cause future trouble. These statements, however, must not be interpreted as a condemnation of the use of chlorine disinfectants, but rather as a warning for their intelligent application.

These failures to obtain cleanliness certainly are not due to dairy

* Read at a Joint Session of the Laboratory and the Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 15, 1928.

engineering, for on every hand there are appliances that should insure clean equipment and utensils. One of the most striking examples is the soaker type of bottle washer, a heritage of the brewery, yet efficient. Apparently the advances in dairy sanitation made during the past few years have been due to the contributions of engineers. On the other hand, the washing compounds so necessary to obtain cleanliness are practically the same as they were ten or even twenty years ago. Why? Possibly their inadequacy is due to failure to determine the fundamentals and to select chemicals that can meet the demands made upon them.

THE GERMICIDAL PROPERTIES OF ALKALIES

A dairy detergent must be an efficient germicide and also an effective cleansing agent. During recent years considerable attention has been given to the germicidal efficiencies of the alkaline washing compounds. Research has indicated that hydroxyl ion concentration is an important factor in the germicidal action of such compounds. This was first indicated in the work of Myers[1] and later substantiated in studies on the effect of alkali solutions on bacteria found in unwashed milk bottles by Mudge and Lawler.[2] On the other hand, work by Levine, Buchanan and coworkers has indicated that germicidal efficiency, while a direct function of the hydroxyl ion concentration, does not depend upon the degree of alkalinity alone. As the result of a study upon the germicidal efficiency of sodium hydroxide, and of sodium hydroxide-carbonate mixtures at the same hydroxyl ion concentration, these investigators suggest that the undissociated sodium hydroxide rather than the hydroxyl ion concentration might be the controlling factor in germicidal efficiency.[3] Considerable support was given this theory in their later study wherein the addition of various salts to sodium hydroxide markedly increased its disinfecting properties.[4] Their results, however, are more particularly applicable to problems where considerable concentrations of caustic can be utilized—a practice that must be avoided in a majority of dairy cleansing operations due to its corrosive action upon metals and danger of injury to individuals who may come in contact with it.

It will be found in practice that where the relatively non-corrosive alkalies are used their concentrations generally are doubtful factors in germicidal activity. It is therefore possible that more attention to the hydroxyl ion concentrations of such solutions might prove of considerable value as a public health measure. Yet, while this research has been fundamental, it has not solved the problem. The bactericidal effect of a dairy detergent is of paramount importance; yet its cleansing

properties are equally as vital, for unless the contact surfaces are free from all traces of adhering milk particles, a source of future contamination remains. Aside from the colin-aerogenes types, the alkali formers, miscellaneous non-spore-forming rods, and several species of micrococci which have been found associated with dairy utensils and equipment, there are instances where spore-forming bacteria have been added to milk in significant numbers from pasteurizing equipment because inadequate cleansing permitted their growth in the milk solids which had cooled on the exposed surfaces.[6]

DAIRY CLEANSING PROBLEMS

In dairy cleansing problems, there are normally three classes of "dirt" that a detergent has to remove: (1) particles of dirt or milk solids held to the surfaces by an oily or greasy binder of milk fat; (2) the dirt or milk solids held by adsorption to the surfaces; (3) the "milk stone" deposits accumulated on surfaces subjected to intense and intermittent heat applications.

THE ELIMINATION OF FATTY FILMS

The emulsification of the milk fat will break the binder holding the entrapped particles and render their removal (as well as that of the dispersed fat) by rinsing an easy matter. Soap solution possesses cleansing properties of this character but is inadequate because of precipitation and other chemical reactions. Of the alkalies commonly used in dairy washing compounds, sodium hydroxide, tri-sodium phosphate, sodium carbonate and bicarbonate constitute the bulk of the supply. Caustic soda because of its corrosive nature is objectionable and its applications are limited.

When melted milk fat is added to tepid water and shaken vigorously, droplets of fat form, which quickly join together as a layer of fat on the surface. If a 1 per cent aqueous solution of tri-sodium phosphate is used, a more or less opaque mixture results, and not until several minutes have elapsed will a film form at the surface. When chemically pure sodium carbonate or bicarbonate is used, almost immediately droplets of milk fat larger than those discernible in the phosphate solution will rise to form a film. A mixture of c.p. sodium carbonate and tri-sodium phosphate, as well as commercial products containing these two, will dissipate the emulsifying property of the phosphate at the expense of the carbonate.

By adding equal quantities of melted milk fat to given aliquots of 1 per cent aqueous solutions of the alkalies to be tested, at a constant temperature, it is possible to evaluate relative emulsifying properties

by measuring the size of the droplets rising to the surface, and determining the time consumed in forming fat layers of uniform thickness. In the author's experience 45° C. is the most practical temperature for these tests. It is suggested that the water supply used in the washing operations be used as the solvent in order to approximate practical conditions.

The author's experience is that crystalline tri-sodium phosphate is the most efficient of the alkalies studied. Mixing this with sodium carbonate or bicarbonate, or using mixtures containing them invariably dissipated the emulsifying properties of the phosphate. Sodium hydroxide gave the same results.

THE SUSPENSION OF DIRT PARTICLES

The removal of adherent dirt particles and milk solids can best be accomplished by their suspension in the detergent solution. While soap solutions owe their cleansing power in part to this property of colloidal suspension (i.e., adsorption), their use is limited because of the difficulties mentioned above.

If finely divided charcoal (freed from oil or grease by washing with ether) is added to water and shaken, it settles. If a 1 per cent aqueous solution of c.p. tri-sodium phosphate or sodium hydroxide is used, the charcoal will remain in suspension and the liquid will resemble ink. The particles of carbon are so fine that instead of forming a precipitate, they attach themselves to the alkalies and remain suspended. This action looks like disintegration but is not. If a suspension of carbon black in water is filtered several times through paper, the water will finally run through clear, while the carbon black will be held back. If a solution of sodium phosphate or hydrate is then poured on the filter, a black filtrate is obtained and the paper becomes clean. The cellulose adsorbs the carbon black and clogs the filter so that the pores are not large enough to let the remaining particles through. The alkali solutions remove the carbon black because it is more strongly adsorbed by them, and, therefore, goes through the paper. That this is the explanation can be shown in three ways: (1) The experiment does not succeed if the carbon black is too coarse; (2) if the black filter paper is reversed and washed with water, it will remove only the carbon black that is not in immediate contact with the paper; (3) microscopic examination of the black filtrate will reveal the presence of charcoal particles.

The adsorption of carbon black by filter paper offers a means of determining the relative dirt suspending powers of alkaline washing compounds. If a strip of filter paper is dipped into an aqueous sus-

pension of carbon black, the charcoal will not spread appreciably although the water will rise over a considerable area. If, however, a strip of filter paper is dipped into suspension of carbon black adsorbed by an alkali, the charcoal will spread nearly as far as the liquid, because it is more strongly adsorbed by the alkali than by the filter paper. By dipping uniform strips of filter paper into comparable test suspensions of carbon black for a given period of time, we have a means of evaluating the relative dirt suspending powers of the different detergents being studied. No particular attention need be given the temperature except that it is constant in all the tests. The filter paper should just touch the surface of the test suspension. A detergent solution which gives an area of blackness on the filter paper equal to that of adsorbed liquid is more efficient than one which gives a fainter color or a smaller black area.

It has been found that c.p. tri-sodium phosphate crystals proved superior as a suspensory agent. Sodium hydroxide was practically as efficient as tri-sodium phosphate. Sodium carbonate and bicarbonate were markedly inferior to these two alkalies. Mixing the chemically pure phosphate or hydrate with either the carbonate or bicarbonate decreased the adsorption properties of the former. Commercial products containing mixtures of the phosphate or hydrate with the carbonates produce suspensions inferior to those of the c.p. phosphate or hydrate but superior to those of the c.p. carbonate or bicarbonate.

THE PREVENTION OF " MILK-STONE " DEPOSITS

While the calcareous deposit of so-called " milk stone " has been considered as a third class of dirt encountered in dairy cleaning problems, it is more properly the product resulting from the reaction of certain constituents of commercial washing compounds with the calcium salts found in " hard " water, but involving the protein of milk, which apparently hastens its formation.

The first explanation for the formation of this shell-like incrustation is found in the well known treatment of " hard " water whereby calcium carbonate is precipitated by the addition of sodium carbonate. This, however, does not account fully for this formation, as casein is precipitated by calcium salts such as are found in " hard " water. Slightly sour milk coagulates upon boiling, which explains the formation of the original coagulum found on pasteurizer coils. Apparently a localized acidification aided by the intense heat is the contributing factor. Casein, not unlike charcoal, is peptized by alkalies. The peptizing action of the alkaline earths is less marked than that of the alkalies because the adsorption of the bivalent cations cuts down the

peptizing action of the hydroxyl. When peptized by hydroxyl, casein is precipitated by calcium salts.

In view of these facts and their relation to the problem of dairy detergency, involving as it does the use of " hard " water containing calcium salts varying with the locality, a few experiments with casein were undertaken. Since in practice the milk coagulated on the surfaces of pasteurizers, coils, etc., represents a relatively high concentration of casein, tests were conducted using as high as 1 gm. of purified casein with only 50 c.c. aliquots of 1 per cent aqueous solutions of the various alkalies and commercial products studied. In all of these experiments large test tubes with their contents were heated to 180° F. and agitated gently before any observations were noted. In this way it was assumed that the soaking of equipment to be cleansed would be approximated.

It was found under the conditions of these experiments that c.p. caustic soda formed an apparent solution with casein while crystalline tri-sodium phosphate peptized most of the casein with the formation of a flocculent precipitate that settled only as the temperature was lowered. The carbonate and bicarbonate produced a less marked peptization with the formation of a sandy precipitate. These experiments were then repeated with the addition of very small and uniform amounts of calcium sulphate (approximately 0.03 per cent) in order to establish an exaggerated and artificial " hard " water condition. While similar results were obtained as regarded the peptization of the casein, the tubes containing the hydrate, carbonate and bicarbonate had turbidities that were not detected in those containing the phosphate. Upon the completion of these tests, it was noticeable that the tubes containing the bicarbonate and carbonate solutions were coated on the inside with a rough calcareous deposit resembling " milk stone." Vigorous rubbing failed to dislodge this incrustation but it was readily dissolved by hydrochloric acid. Furthermore, soaking these tubes with hot solutions of phosphate after first removing all superficial material by thorough rinsing soon made it possible to remove such deposits with a little brushing.

While the adsorption of hydroxyl ion accounts for the degree of peptization of casein by the alkalies studied, it is difficult to explain its apparent protective colloidal action in the presence of phosphate and its precipitation by the calcium sulphate in the carbonate and bicarbonate solutions. It is possible that in the phosphate tests, a colloidal solution of calcium phosphate was formed through its adsorption by the casein. Carbon black is similarly adsorbed by casein and more strongly so than any of the alkalies studied.

It was found in these experiments on " milk stone " that only crystalline tri-sodium phosphate would prevent its formation. Mixing this with any of the other alkalies, as well as using commercial products containing mixtures of these alkalies, would invariably result in the formation of " milk stone."

DISCUSSION AND SUMMARY

While the few experiments outlined are concerned primarily with detergency from the standpoint of the elimination of " dirt," there is another phase which has not yet been properly investigated. It is conceivable that the phenomena of emulsion and adsorption increase the penetration of the germicidal substances to the bacteria entrapped in greasy films or adhering to " dirt " particles and the equipment. In addition, spore-formers or other resistant microörganisms might possibly be eliminated if adsorbed either by the detergent solution or by " dirt." Some indications of this were seen in the results of an investigation of a colloidal alkali mixture used in cleaning milk bottles.[6] It was demonstrated in field experiments with an automatic bottle washer, that a colloidal-alkali mixture containing caustic soda was more effective germicidally than caustic soda used alone. Thus it appears that the " availability " or " penetration " of the lethal agent increases germicidal efficiency.

From the reported observations upon the detergency of the alkalies and commercial products, it has been indicated that crystalline tri-sodium phosphate has chemical and cleansing properties which particularly recommend it for use in dairy detergency. Mixing the phosphate with carbonate or bicarbonate is objectionable as such admixtures will diminish its emulsifying properties; reduce its power of adsorption; and induce the formation of " milk stone."

It appears from the results obtained that chemical purity is vital if consistent cleansing action is to be assured. Apparently the satisfactory method for preparing a dependable dairy detergent involves the synthesis of chemicals possessing a degree of chemical purity formerly regarded as unnecessary. If dairy cleansing processes are to acquire a stability now lacking in most instances, it is essential that the same discrimination be exercised in the selection of the detergent as in choosing the alkalies used in baking powder in contrast to those used in an agricultural fertilizer.

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Results Obtained in Phenolic Wastes Disposal under the Ohio River Basin Interstate Stream Conservation Agreement*

F. HOLMAN WARING

Chief Engineer, State Department of Health, Columbus, O.

PHENOL and other tarry acids, the sources of great annoyance in water supplies, originate in the coking of coal. This enterprise is as old as the manufacture of steel; and coking follows steel manufacture in the growth of its importance.

Twenty-five years ago practically all coke was made by the beehive process. No effort was made to recover by-products; hence there were no problems incident to recovery and refinement of coal gas and coal tar products. A few years prior to the outbreak of the World War the situation began to change. Steel companies began installing ovens of the by-product type, and many millions of dollars worth of by-products formerly consumed and wasted were salvaged, chiefly ammonia, tar, benzol, naphthalene and toluol solvents.

Following 1914, a great impetus was given the industry, through the loss of shipments from Germany, and the manufacture of war materials demanding many ingredients derived from coal tar products. All coke ovens built in the last 10 years are of the by-product type; and fully 75 per cent of coke manufactured is from the by-product oven.

LOCATION OF BY-PRODUCT COKE WORKS

Because coke is utilized largely for supplying carbon in the manufacture of steel, coke plants are largely located near iron and steel centers. The steel industry selects its location for the minimum transportation expense of both raw and finished materials. Coal is a most important raw material. The most notable of these centers is the Pittsburgh district, embracing the upper Ohio River valley, western Pennsylvania, and northeastern West Virginia. The Youngstown district, also on the Ohio River drainage area, is an important location for this industry. Two other large centers are the Cleveland district in northeastern Ohio on Lake Erie, and the Chicago district at the southern shore of Lake Michigan. Proximity by way of easy transportation to the iron ore, and easy reach to the markets for the finished steel product, have made for the rapid and extensive development of these two centers of the steel industry.

A number of factors have influenced the locations of the newer by-product coke plants that are not associated strictly with the manufacture of steel. Manufacture of domestic coke, favorable sale of fuel and illuminating gas, and cheap transportation of high-grade coal are the more important influences. A center of such char-

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acter is located on the Ohio River in the vicinity of the junction of West Virginia, Ohio, and Kentucky. It is also probable that with the decline in the supply of natural gas in this region a more intensive development of the by-product coke industry will take place.

SOURCE OF PHENOLIC WASTES

Liquid wastes result from the coking of coal and the recovery of by-products in the following manner: The hot gases driven from the coal during coking must be cooled before the product may be utilized for fuel or illuminating purposes. In the coking process a condensate of water, ammonia, oil and tar is produced.

The most common type of by-product coke plant employs the indirect method whereby the cooling water is circulated in pipes around which the hot gases pass to form a condensate which is then removed for refining of valuable constituents. Further cooling and refining follows when the gas is bubbled through sulphuric acid where the free ammonia is transformed into ammonium sulphate. Final cooling and refining of the gas is afforded by a direct scrubbing with cool water followed by a direct scrubbing with cool oil, whereby the benzol, naphthalene and light oils are removed from the gas. The condensate from the preliminary cooling of the gas is treated with lime and distilled for the additional production of ammonia. This type of plant is usually designated a sulphate plant, owing to the manner in which the ammonia is recovered and marketed. It is the residues from the ammonia stills that contain the phenolic substances which must be disposed of.

The other type of by-product coke plant, less common than the above, differs in process by the employment of direct scrubbing with water for gas cooling and refining and for production of ammonia. After separation of tars and oils by gravity, the entire volume of cooling water thus becomes weak ammonia liquor and must be distilled for concentration of the liquid ammonia. The tars separated from the scrubbing of the gases are treated with lime; and, combined with the residue from the free ammonia still, are further distilled to procure the fixed ammonia. This type of plant is ordinarily designated a liquid ammonia plant, because all the ammonia is recovered and marketed as aqua ammonia. Again, the residues from the ammonia stills, which contain the phenolic substances, must be disposed of. An important item of note is that the volume of still wastes to be disposed of in this process is greater, perhaps 3 to 4 times that of the sulphate plant.

Until comparatively recent years it was the general practice to discharge these still wastes untreated, directly into the rivers, streams, and lakes adjacent to the by-product coke plants. In numerous instances these bodies of water were the sources of public water supplies, in such close proximity as to be affected thereby and become the objects of serious complaint.

EFFECT OF PHENOLIC WASTES UPON PUBLIC WATER SUPPLIES

Phenolic substances, even when present in minute amounts, impart to water a taste and odor that may be decidedly objectionable. When unaffected by other chemical agents these phenolic substances give to the water a " carbolic " or medicinal flavor. In contact with chlorine, used extensively in water purification practice, the chloro-phenol gives to the water a sort of iodoform taste and odor even more objectionable and far reaching. Observers are generally agreed that these tastes and odors are developed with the phenolic wastes in contact with ordinary filtered and chlorinated water in dilutions as great as 1 part of phenol to 50 million parts of water.

From a public health standpoint these phenolic wastes may possibly have the following ill effects: (1) The presence of phenol in drinking water may exert directly a deleterious effect upon the health of persons using such water (Elyria and East Liverpool, O.). (2) The existence of an offensive taste and odor discourages the use of water for drinking in the amounts necessary to promote health. (3) The existence of such tastes and odors likewise encourages the use of other sources of water supply which, while of pleasing physical quality, may be contaminated and unsafe (Ironton, O.). (4) The fact that chlorine treatment of a public water supply intensifies the tastes and odors, may result in a reduction of the amount of chlorine used or the total suspension of the chlorine treatment and consequent failure to secure sufficient disinfection.

Early experiences with phenolic tastes and odors in drinking water supplies resulted of course in much embarrassment to water works officials charged with the duty of furnishing pure and potable water to the public. Every effort was made to find some method adapted to water purification practice whereby the phenolic substances could be successfully modified or removed. Very little or no success has attended the years of constant research along these lines. A certain degree of relief from the intermittent occurrences of phenolic tastes has been attained at those places where the most elaborate and double treatment devices permitted temporary cessation of chlorination in the water purification process; or where lime softening could be substituted for chlorination to bring about the disinfection of the water supply. However, if the concentration of the phenolic wastes became great enough, the tastes and odors again were the source of complaint. The margin between the amount that would only cause trouble in contact with chlorine and that which would alone be objectionable was not enough to make dispensing with the use of chlorine in water treatment practice a satisfactory solution to the problem.

EXPERIENCES WITH PHENOLIC WASTES AND EARLY EFFORTS OF INDUSTRY TO ERADICATE THEM

From the foregoing remarks concerning the history and location of the by-product coke industry, it is not surprising that the first difficulties incident to disposal of wastes from this class of industry originated in the upper Ohio valley. One of the earlier cases on record was at Newcastle, Pa.[1] In December, 1912, the city experienced a severe occurrence of phenolic tastes and odors in the public water supply lasting six or seven weeks. Legal proceedings were instituted by the Newcastle Water Company against the Carnegie Steel Company of Farrel, Pa., which resulted in a financial settlement and an agreement on the part of the steel company to prevent further disturbance. The objectionable wastes were eliminated by the installation of a coke quenching system completely utilizing these wastes.

At Johnstown, Pa., the Cambria Plant of the Bethlehem Steel Company, at the instance of the Pennsylvania Department of Health, installed, early in 1916, a quench system to dispose of the phenolic wastes in order to protect the Conemaugh River, a tributary of the upper Ohio, from which stream the city took its public water supply.

Likewise at Clairton, Pa., the Carnegie Steel Company installed, in 1918, a quench system for eliminating the phenolic wastes from the Monongahela River, also in the upper Ohio River valley, from which McKeesport, Pa., takes its water supply a few miles downstream from Clairton. The installation at Clairton serves the largest by-product coke plant in the world, the coal coking capacity at this

works being 30,000 tons per day, or about 6 times that of a plant ordinarily considered a large one.

Other cities in the country experienced periods of marked phenolic tastes in public water supplies in early years. As early as 1917 Cincinnati complained of this trouble and in 1918 and 1919, Morgantown, W. Va., Youngstown, O., Louisville, Ky., and other Ohio River cities also began to complain. Outside of the Ohio River drainage area bad reports were heard—Milwaukee, Cleveland, Rochester, Buffalo, and more recently Chicago and the other cities in the southern Lake Michigan district.

The Cleveland experiences of 1922 and 1923 were particularly aggravating, and culminated in the installation of quench systems for the elimination of phenolic wastes by three companies, the American Steel & Wire Company, the McKinney Steel Company and the Otis Steel Company. All three formerly discharged untreated wastes into Cuyahoga River, which entered Lake Erie a few miles from Cleveland's water intakes.

APPLICATION OF INDUSTRIAL SCIENCE TO THE PROBLEM

The so-called quench system, while seemingly quite simple, and satisfactory from the standpoint of protecting water supplies, is far from satisfactory to industry. The initial expense of installing the quench system for a new by-product coke plant is negligible, merely that of arranging the sewer system on the separate plan whereby all phenolic waste waters flow to a central sump or storage basin from which they are pumped to the coke quenching tower. For a by-product coke plant already established it may mean a very considerable expense to rearrange the sewer system, often involving the pumping of the flows two or more times. At one plant of the Youngstown Sheet and Tube Company this initial expense of rearrangement cost in the vicinity of $250,000 for a coke plant of 5,000-ton daily capacity.

The maintenance of a quench system is costly. The phenolic wastes are corrosive, and attack the metal piping and pumping equipment, also the quench tower metal parts, quench cars, tracks, and draining platforms. The life of the equipment, variously estimated at 7 to 10 years when using clean water for quenching, is cut to 2 to 4 years when using phenolic wastes. At the largest by-product coke plant in the world, Clairton, Pa., with a 30,000-ton daily coking capacity, the maintenance expense averages $60,000 annually.[2]

The quenching system is chiefly objectionable to industry because of the bad effects of the phenolic wastes upon the coke produced. In spite of a considerable volume of clean make-up water being required daily, an objectionable phenolic odor is imparted to the coke thus quenched, making it unfit for the domestic trade; that is, the customers simply will not stand the odoriferous material in their cellars. In the case of the liquid ammonia type of plant, where the total volume and amount of phenolic materials are from three to four times that of the sulphate of ammonia type, it becomes difficult to use up all of the liquid by the quench operation; with the result that the coke receives a stronger odor and is made soggy with moisture. The excess of moisture impairs the quality of the coke for the furnace trade and the manufacturer suffers accordingly.

The foregoing unsatisfactory experiences with the quench method of eliminating phenolic wastes have compelled industry to devote intensive study and research to this problem. American practice following the World War has developed means of refining further valuable constituents from the coal tar residues, including the

commercial extraction of phenol. The first attempt on a plant scale to be demonstrated in this country was the so-called benzol extraction process of phenol recovery installed by the Lorain, O., plant of the National Tube Works in 1924.[3] This by-product coke plant has a daily coking capacity of about 4,200 tons. Briefly, this type of recovery process comprises means for scrubbing with benzol the ammonia liquor from which the free ammonia has been distilled, but before the addition of lime for distilling off the fixed ammonia. The benzol absorbs or carries the phenol constituent of the liquor; subsequent separation of the phenol from the benzol carrier is accomplished by scrubbing the benzol with caustic soda, which converts the phenol to sodium phenolate, permitting gravity separation from the benzol. The benzol thus freed from the phenol is returned for additional carrier duty and the sodium phenolate neutralized with acid to free the phenol, or otherwise refined.

Following the experiences of the Lorain plant, similar works were installed at Buffalo and Troy, N. Y., in 1925 and 1926 respectively; and at Fairmont, W. Va., in 1927. Certain refinements in mechanical detail were perfected and different capacities in the absorbers and scrubbers employed; otherwise the Lorain experience was followed. As a result of the refinements, the percentage of phenol recovery was increased from 70 to 75 per cent, attained originally at Lorain, to 95 to 98 per cent at Fairmont. An estimate of the expense of installation and operation for the Fairmont plant was given to the Third Annual West Virginia Conference on Water Purification (1927) by Hugh E. Jones, chemical engineer of the Domestic Coke Corporation.[4] The daily coking capacity of the Fairmont Works is about 1,000 tons. The initial cost of the phenol recovery plant was about $25,000, and the cost of maintenance and operation is said to about equal the sale value of the phenol recovered. The success of the Fairmont plant is attested by the experience of the Morgantown, W. Va., water works, 20 miles downstream on the Monongahela River, as reported by Prof. W. W. Hodge of West Virginia University;[4] namely, the public water supply no longer contains objectionable phenolic tastes and odors.

Three other types of phenol recovery plants have been installed in the Ohio River valley. In April, 1928, the Midland, Pa., plant of the Pittsburgh Crucible Steel Company, with a coking capacity of 1,800 tons daily, placed in operation the Heffner-Tiddy process. In this method a preliminary scrubbing with benzol of the ammonia liquors containing the phenol is proposed to recover perhaps 60 per cent of the phenol, as already described for the Lorain and Fairmont plants. However, this preliminary treatment with benzol and subsequent recovery of phenol as sodium phenolate has not as yet been provided at the Midland plant. The ammonia liquor simply passes to a specially constructed ammonia still wherein the ammonia concentrations, and temperatures between 98° and 103° C., are controlled so as to cause the phenol to go over as ammonium phenolat . What becomes of the ammonium phenolate has not yet been definitely established. It may pass on through with the gas and be consumed; it may escape to the atmosphere in the cooling of the final cooler water; it may remain behind in the saturator; or it may contaminate the light oils. Data on the cost of installation and operation have not yet come to the attention of the writer. Also it is perhap soon to state what success has attended this installation. The patent owners expect to obtain from 95 to 98 per cent removal efficiency.

In May, 1928, the Ironton, O., plant of the Ironton By-product Coke Company, with a daily coking capacity of 1,300 tons, put into service a phenol recovery proc-

ess somewhat similar to the benzol type already described, except that light oil is used for the carrier instead of benzol. Since the Ironton plant does not manufacture benzol, the "light oil" type seems particularly adapted. Because the Ironton plant is also a liquid ammonia type of by-product coke plant, handling several times the volume of phenol bearing liquid handled by the sulphate type, the capacities of the scrubbers and absorbers are correspondingly larger; and furthermore because light oil is used in place of benzol these capacities have been specially worked out and may differ somewhat from those where benzol would be used. The phenol recovery plant at Ironton cost about $65,000 to install. Operation costs have not yet been released. Results for the first two months of operation have shown 90 to 95 per cent efficiency of phenol recovery; and expectations are for 95 to 97 per cent efficiency.

In September, 1928, the Hamilton, O., plant of the Hamilton Coke & Iron Works, coking capacity 1,200 tons daily, installed a phenol recovery process of the Koppers type. This process will probably be described more fully in another paper. Briefly, the process involves ordinary ammonia stills with careful heat control between 98° and 102° C. The liquor, from which the free ammonia has been driven, is pumped to the top of a scrubber through which steam and gas in large volume are passed. The phenol is volatilized and thus separated in a gaseous state from the liquor, which proceeds to the fixed ammonia still. The volatilized phenol is then absorbed in caustic soda scrubbers. The cost of this particular installation is understood to be in the vicinity of $40,000. Efficiency of phenol removal is claimed for this process of 95 to 98 per cent. Residues from the process will be evaporated upon the hot slag dump having an interior sump with no outlet to the river.

REACTION OF THE PUBLIC TO THE PROBLEM

It is not a difficult matter to determine what the public's attitude is toward a situation of this kind. Past experiences have been too numerous to recite where the public water supplies have been injured with phenolic tastes and odors. In a survey of such conditions in the Ohio River valley, H. R. Crohurst, of the U. S. Public Health Service, found in 1924[5] that 25 public water supplies were already badly affected and at least 25 more were likely to be, as a result of the operation of some 19 by-product plants within the area. Outside of the Ohio River valley important disturbances at various times have occurred at Cleveland, Buffalo, Milwaukee and Chicago in the Great Lakes area; and at Rochester, Troy and other places in New York.

Summing up the situation from a popular standpoint, there appears to be an immediate demand for complete relief. This demand usually is insistent and compelling, and more than likely may result in hasty and ill-advised actions. Most certainly, if the disturbances are frequently recurring, and if steps are not taken to alleviate the conditions, the public demands result in drastic action either embarrassing to industry, to public officials, or to both. As far as the public is concerned the end result is what counts and must be obtained; namely, a water that is not rendered unpalatable for drinking nor offensive for culinary and other domestic purposes.

The public ire is first directed toward the local water works officials, who are blamed for "doping" the water unnecessarily with the chemicals used in ordinary water purification practice. Frequently hasty removal of water works officials results, or attempts are made in this direction. Eventually the public learns that

these officials are not to blame and ire is next directed toward administrative officers having jurisdiction over the supervision and protection of public water supplies; thus local health officials and state health department officers are drawn in. The usual cry is for the industry causing the trouble to be forced to stop all operations forthwith; if legal powers are not deemed sufficient, make them so; or obtain injunctions to restrain the industrial operations causing the objectionable contamination. Failure to act thus and immediately seems to inspire in the average mind a contempt for the local or state official. Too often the public cannot understand why the problem cannot easily be solved, and solved permanently, by such simple expedients as passing new laws or local ordinances or asking the federal government to enact and enforce prohibitory legislation.

It takes courage on the part of administrative officials to embark upon any sensible plan of coöperation with industry in the study and formulation of a logical means of eliminating the stream pollution evil and at the same time be fair to all parties concerned. Much energy must be spent in educating the public and explaining the wisdom of concerted and coöperative action with industry. Recently the Ohio and Kentucky Health Departments have experienced particularly trying situations at Cincinnati and Louisville respectively. Federal legislation proposed by Cincinnati representatives was openly contested by the health authorities as not being the adequate or sensible way of eliminating the phenol, or any other pollution problem, especially in view of results being attained by other means.

ATTITUDE OF ADMINISTRATIVE OFFICERS CHARGED WITH WATER SUPPLY SUPERVISION AND PROTECTION

The present coöperative attitude of the health department officials of the states in the Ohio River basin is the result of a progressive development beginning in 1923. The earlier experiences of Pennsylvania Health Department officials in dealing with the situation at the Cambria plant of the Bethlehem Steel Company at Johnstown, Pa., and later at the Clairton plant of the Carnegie Steel Company were studied by the Ohio Health Department officials and found to be productive of the desired results without recourse to legal proceedings or other possible antagonistic methods. It was decided to try out the coöperative method with industry in the case of the Cleveland disturbances of late 1922 and early 1923. At about the same time the Surgeon General of the U. S. Public Health Service was asked to call into conference the officers of all states in which the phenolic wastes problem existed, in order to learn the extent of the problem and to consider ways and means to care for the same. Such a conference was held at Washington, D. C., May 18, 1923, and again January 29, 1924.

In the meanwhile the Ohio Health Department officials were putting into practice in the Cleveland district the idea of coöperation with industry. The late Judge E. H. Gary, chairman of the Board of Directors of the U. S. Steel Corporation, assured Dr. John E. Monger, Director of Health of Ohio, that he might expect 100 per cent coöperation and prompt application of remedial actions not only in the Cleveland district but at any other locality where the U. S. Steel or subsidiaries were operating.

Based upon such a splendid response from industry and as a result of previous conferences with the U. S. Surgeon General, an interstate conference was called at Pittsburgh, Pa., on April 14, 1924, attended by health department officials and all of the by-product coke plant officials located in the Ohio River basin. The importance of the problem was thoroughly discussed; also practical ways and means for

eliminating the objectionable wastes. The industrial officials agreed that immediate action on their part was required and pledged complete coöperation to rid the Ohio River and its tributaries of phenolic wastes as promptly as possible. The health department officials in turn pledged their coöperation through uniform policies and reasonable requirements.

Pursuant to these earlier conferences and understandings the State Health Commissioners of Ohio, Pennsylvania and West Virginia met at Pittsburgh, Pa., November 17, 1924, and entered into formal agreement for a uniform policy of conservation affecting the interstate streams of the three states named.

OHIO RIVER INTERSTATE STREAM CONSERVATION AGREEMENT

By the terms of this original compact it was agreed—

> That the Departments of Health of Pennsylvania, Ohio, and West Virginia, represented respectively by the Secretary of Health of the Department of Health of Pennsylvania, the Director of Health of Ohio, and the Health Commissioner of West Virginia, hereby agree to coöperate in carrying out a policy for the conservation of the interstate streams in these states, including the correction and prevention of the undue pollution thereof, to the end that the said streams may be rendered and maintained as suitable sources of public water supplies as aforesaid.

By way of a supplement Kentucky was made a party to the agreement at a conference held in Pittsburgh, February 18, 1926. Also by supplement the states of New York, Maryland, Illinois, Indiana, and Tennessee were made parties to the agreement at a conference held in Pittsburgh, September 27, 1926, and in 1928 by supplement the states of North Carolina and Virginia were also made parties to the agreement.

Although the agreement had its inception on account of the phenolic wastes problems its terms were purposely made much broader. A gradual expansion of the workings of the agreement led to the adoption of a resolution on the part of the several health commissioners, signators to the Ohio River Interstate Stream Conservation Agreement, at a conference in Cincinnati, October 18, 1927. This resolution constitutes an important explanation of the working of the agreement and is therefore quoted:

> WHEREAS it is necessary to adopt certain policies and procedures in order effectively and efficiently to carry out the letter and the spirit of coöperation and conscience upon which the Ohio River Interstate Stream Conservation Agreement is founded, therefore be it
>
> RESOLVED that the following policies and procedures be adopted as part of the said agreement.
>
> 1. The Chief Engineers of the Departments of Health, signators to the Ohio River Interstate Stream Conservation Agreement, shall constitute the "Board of Public Health Engineers of Ohio River Basin" hereinafter referred to as the Board.
>
> 2. The Board shall meet at least annually during the first week of December and shall recommend, from time to time as may be deemed necessary, to the Health Commissioners, signators to the Agreement, ways and means for effectively and efficiently carrying out the letter and the spirit of the Agreement.
>
> 3. As adequate protection of public water supplies from damage caused by phenol and other tarry acids discharged into the source of such supplies requires substantially complete and continuous elimination of the discharge of wastes containing such constituents, or substantially complete and continuous removal of such constituents prior to discharge; therefore the signators of the Agreement should promptly institute action to require such elimination or removal by suitable treatment prior to discharge.
>
> 4. The signators to the Agreement will notify promptly downstream or adjacent signators of unusual events affecting the Ohio River or its tributaries, such as phenol

TABLE I

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN OHIO
1914–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Trumbull Cliffs Furnace Co.	Warren	July 7, 1924	1,275	Mahoning	July 7, 1924	90	Aug., 1926	93	Coke Quenching and Ponding
The Youngstown Sheet & Tube Co.	Youngstown	May, 1917	1,400	"	"	—	Aug., 7, 1926	100	Coke Quenching
Republic Iron & Steel Co.	"	Apr. 20, 1914	4,000	"	Aug. 15, 1925	20	Jan. 26, 1926	100	" "
The Youngstown Sheet & Tube Co.	Canton	Aug., 1916	5,000	Nimishillen	"	—	Oct. 8, 1926	100	" "
The Youngstown Steel Corp.	Massillon	Oct. 1, 1916	865	Tuscarawas	June, 1923	80	June, 1926	100	" "
Central Alloy Steel Corp.	Ironton	Apr. 21, 1927	1,070	Ohio	"	—	Apr. 21, 1927	100	Phenol Recovery
Central Alloy Steel Corp.	"	July, 1918 *	1,350	"	March, 1926	30	May 28, 1928	95	Phenol Recovery
The Ironton By-Product Coke Co.	Portsmouth	Jan., 1918 †	2,200	Miami	"	—	Aug. 1, 1926	95	Coke Quenching Ponding
The Portsmouth By-Product Coke Co.	Hamilton	Apr. 20, 1928 ‡	1,220		Apr. 20, 1928	80			
Hamilton Coke & Iron Co.									

* By-product coke plant out of operation from Dec., 1920, to Oct., 1922
† Phenol recovery equipment being installed; coke plant shut down from Jan., 1921, to Dec., 1921; operation treatment works suspended from Nov. 1, 1927 to June 1, 1928
‡ Phenol recovery works under construction; to be completed about Sept. 29, 1928

TABLE II

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN KENTUCKY
1913–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
The Ashland By-Product Coke Co.	Ashland	Aug., 1913	1,800	Ohio	—	—	Oct. 31, 1928 *	95	Phenol Recovery

* Phenol recovery works under construction; to be completed about Oct. 31, 1928

TABLE III

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN WEST VIRGINIA
1914–1928

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Domestic Coke Corp.	Fairmont	Dec., 1920	1,000	Monongahela	1926 *	—	Jan., 1927	96	Phenol Recovery
Weirton Steel Co.	Weirton	July, 1923	2,300	Ohio	Nov., 1926 †	100	——	—	Coke Quenching
Wheeling Steel Corp.	Follansbee	Feb., 1917	2,600	Ohio	——	—	——	—	No treatment
Semet Solvay Company ‡ (National Tube Co. Plant)	Benwood	——	800	Ohio	——	—	——	—	No treatment

* Lagooning and quenching with wastes attempted, later discontinued
† Coke quenching operations began in 1926, were discontinued during 1927
‡ Plant shut down since Dec., 1926

TABLE IV

OPERATION OF BY-PRODUCT COKE PLANTS AND PHENOL TREATMENT WORKS IN PENNSYLVANIA

Name of Company	Location	Date By-Product Plant Started Operation	Coal Coking Cap. Tons Per 24 Hours	Receiving Stream	Partial Phenol Waste Elimination System Placed in Service		Complete Phenol Waste Elimination System Placed in Service		Method Now Used
					Date	Per cent Removal	Date	Per cent Removal	
Bethlehem Steel Co. (Franklin Plant)	Johnstown	1895	3,500	Conemaugh	—	—	1916	100	Coke Quenching
Bethlehem Steel Co. (Rosedale Plant)	Johnstown	1919	3,500	"	—	—	1919	100	" "
Carnegie Steel Co.	Clairton	June, 1918 *	30,000 *	Monongahela	—	—	June, 1918	100	" "
Jones & Laughlin Steel Corporation (Hazlewood Plant)	Pittsburgh	June, 1919	6,500	Monongahela	—	—	June, 1919	100	" "
Jones & Laughlin Steel Corporation (Woodlawn Plant)	Pittsburgh	1926	3,000	Ohio	—	—	1926	100	" "
Carnegie Steel Co.†	Farrel	1912 ‡	——	Shenango	—	—	1913 † ‡	100	" "
Pittsburgh Crucible Steel Co.	Midland	1922 ‡	1,800	Ohio	—	—	Apr., 1928	95	Phenol Recovery

* Original capacity 10,000 tons daily; additions to by-product coke oven capacity were made in Jan., 1919, June, 1924, and Oct., 1927
† The by-product coke plant at Farrel was dismantled in 1925 ‡ and is no longer operating
‡ Date not verified and is approximate only

spills, typhoid fever epidemics, etc., in order that suitable measures may be taken by such downstream or adjacent signators to the Agreement as are needful to protect the public health.

5. The signators to the Agreement, in matters relevant thereto, will coördinate present and proposed research, exchange data derived therefrom, and exchange ideas on administrative policies for mutual benefit.

6. The signators to the Agreement will furnish to downstream or adjacent signators data concerning discharge of sewage or industrial wastes or the treatment thereof in cases where such matters might prejudicially affect such signators in order to obtain thereby the views and judgment of such downstream or adjacent signators.

7. Any signator to the Agreement invoking the provisions thereof for abatement of alleged harmful pollution shall first establish the fact that the cause of the alleged harmful pollution does not exist within its own jurisdiction but does exist within the jurisdiction of the upstream or adjacent state.

8. The signators to the Agreement in matters involving mutual concern will arrange for joint inspections of water works, alleged pollution of interstate streams, the alleged effects thereof, the stream involved therein, proposed remedies, and reports thereon whenever deemed necessary.

ACCOMPLISHMENTS UNDER THE OHIO RIVER INTERSTATE STREAM CONSERVATION AGREEMENT

As stated previously, elimination of phenolic wastes was the dominant factor in the creation of the Ohio River Agreement. It is pertinent therefore to call attention to accomplishments in this direction, although space will not permit me in this paper to recite in detail certain other accomplishments. Appended will be found a chronological tabulation of data relating to the establishment of by-product coke plants and phenolic wastes elimination devices for all such plants on the Ohio River watershed grouped by states. The chief engineer of the health department of each state is the authority for such data.

It will be noted that Pennsylvania first installed phenolic wastes elimination devices utilizing the quench system. Five plants are located in Pennsylvania in the Ohio River basin, 4 of which installed the quench system prior to the signing of the formal agreement in November, 1924. The fifth plant, that of the Pittsburgh Crucible Steel Company at Midland, installed the Heffner-Tiddy process of phenol recovery April 25, 1928. This action was pursuant to an order of the Sanitary Water Board of Pennsylvania as part of the execution of the Interstate Agreement. The plant is located almost at the Pennsylvania-Ohio state line and affects no Pennsylvania water supply interests. Thus it will be seen that as far as the Ohio River basin is concerned Pennsylvania is taking care of phenolic wastes 100 per cent.

In Ohio none of the 9 by-product coke plants in Ohio River basin had provided for treatment or proper disposal of phenolic wastes prior to 1924; today all have complied with the requirements. Seven are quenching and 2 are recovering phenol. Phenol recovery by the "light oil" method is being practiced by the Ironton By-product Coke Company, Ironton, and by the "Koppers" method at the Hamilton plant of the Hamilton Coke & Iron Works. One or two of those plants now maintaining quench systems are experimenting and studying phenol recovery processes with a view to installing the same at an early date. Thus it will be noted that Ohio has reached 100 per cent in installing phenolic wastes treatment and disposal plants in the Ohio River basin.

Kentucky has but 1 by-product coke plant, located on the Ohio River at Ashland. Pursuant to the terms of the Agreement this company was ordered by the

Kentucky State Board of Health to provide proper disposal of the phenolic wastes, and in compliance therewith has practically completed a phenol recovery works of the " light oil " method. The date for beginning operation is October 31, 1928.

West Virginia has 4 by-product coke plants in the Ohio River basin. One discontinued operation late in 1926. One installed the quench system in order to comply with notifications of the State Health Department; although recent advices are that this plant, of the Weirton Steel Company, has discontinued the quenching operations. Another, the Domestic Coke Corporation of Fairmont, installed, in January, 1927, the " benzol " method of phenol recovery. The remaining one, the Wheeling Steel Corporation at Follansbee, as yet has made no proper disposition of the wastes. It is fair to state, however, that following recent representations on the part of the West Virginia Health Department, the Wheeling Steel Corporation has agreed to install a suitable phenol recovery process, probably following either the " Koppers " or the " benzol " method.

Summing up the Ohio River basin situation, it will be noted that of the 18 plants having phenolic wastes for disposal only 2 have not complied with the requirements regarding the installation of phenol elimination devices.

In addition, the companies operating the phenolic wastes elimination devices who have thus far been approached upon the subject have agreed to report regularly to the several health departments concerning the operation of the plants. In particular, data will be furnished on efficiencies of phenol recovery, tests for phenol in the receiving streams, and prompt information about accidental phenol spills.

NEED FOR SIMILAR REMEDIAL MEASURES ELSEWHERE

Outside of the Ohio River basin there exists need for similar remedial measures. In Ohio there are 6 by-product coke plants on Lake Erie drainage area, 5 of which are operating satisfactory quench or recovery devices; the one at Toledo apparently does not now deleteriously affect any water supply interests, but is investigating a possible recovery installation or other means for the treatment of its phenolic wastes.

New York and Pennsylvania have by-product coke plants, not on the Ohio River watershed, some of which have given concern. Relief measures have been instituted or are under way in most of these cases.

In the southern Lake Michigan district the need for relief has been felt keenly during the past year. Following the precedent of the Ohio River Interstate Stream Conservation Agreement a similar one has recently been effected known as the Great Lakes Drainage Basin Sanitation Agreement.

SUMMARY AND CONCLUSIONS

The results obtained in phenolic wastes disposal under the Ohio River Basin Interstate Stream Conservation Agreement have demonstrated the usefulness and wisdom of this plan. Uniformity in policies, close coöperation of personnel, exchange of information and data, joint actions where the occasion warrants, all make for an effective instrument. Although state laws in many instances grant full authority within their own borders, nevertheless the above mentioned agreement sets forth mainly a program of coöperation between states and with the industrial interests of these states, without detracting from legal means for compelling action that may be warranted in certain cases.

Industry appreciates and demands utmost frankness and fair dealing. It understands that the public interests are paramount and knows that it cannot

affront public opinion, or ignore its righteous demands for relief such as result from offensive pollution of public water supplies.

In setting forth to the by-product coke industry the requirements of the situation in the Ohio River valley, the states, through their health department officials, have tried to be reasonable both as to results to be obtained and in the time allowed for perfecting individual arrangements. As far as phenolic wastes are concerned the criterion of removal has been declared to be substantially complete; that is, the wastes must be modified so as not to render public water supplies objectionable for full domestic uses.

Justice to the industry as a whole also demands fairness in dealing with a few corporations which may be loath to incur the expense of, or hesitate to undertake the task of eliminating the phenolic and other objectionable waste products of industrial operations discharged into our rivers and streams.

The results in the Ohio River basin, which have been obtained by agreement and coöperation, bespeak the merit of the plan. These results have been obtained much better and more quickly than if the matter had been left, as some of our constituents would have had us do, to the enactment of federal laws and the operations of a federal enforcement agency.

We have been criticised for drawing up an instrument without legal force. Our answer is that there are enough laws already. What is needed is a "conscience" between ourselves as state agencies and between us and the industrial corporations involved. This, then, is just what we have endeavored to put into practice.

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NOTE: For discussions of this paper by William L. Stevenson, C. A. Holmquist and Ellis S. Tisdale, see the Public Health Engineering notes on page 817.

Some Aspects of Intestinal Bacteriology in Relation to Health*

LEO F. RETTGER, PH. D.

Professor of Bacteriology, Yale University, New Haven, Conn.

THE human intestine, particularly the colon, is a veritable culture tube. It is in a sense extra-corporeal, and, therefore, suffers constant invasion of an almost endless variety of microscopic organisms, bacteria, moulds and yeasts being ordinarily the most common. Yet, the environmental conditions of the intestine are such that only certain restricted groups or types are able to adapt themselves and carry on a continued existence.

It is still a moot question as to what the various influences are which operate to control the development and activities of the so-called intestinal organisms. It seems to be an established fact, however, that food and the chemical nature of the intestinal detritus play a very important part.

The contents of the intestine of the normal new-born infant are sterile. Very soon after birth microörganisms make their entrance, particularly through the mouth. According to Moro, Tissier and others there is established, in the course of relatively few hours, a heterogenous flora which is in no sense characteristic, and which is succeeded soon by one that assumes a more or less definite relationship, depending upon the nourishment of the child. When the infant is put on mother's milk the intestinal contents soon acquire the biological characteristics associated with breast feeding, the flora assuming a more or less definite picture in which Gram-positive organisms of the bifidus, acidophilus and enterococcus types play a very prominent rôle.

It was long a matter of debate between Tissier and Moro as to which of the two organisms, *B. bifidus* and *B. acidophilus*, is the more prominent. Our own researches have shown that both are present in the intestine during high lactose or dextrine feeding.[1] For example, it was repeatedly demonstrated that the administration of from 3 to 4 gm. of lactose daily to white rats results in the proliferation of the bifidus type to the almost complete exclusion of all other forms, in-

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

cluding *B. acidophilus*. On reducing the amounts of lactose fed daily from 2 to 3 gm., the bifidus type gives way to *B. acidophilus*, which can be maintained at a high percentage level by continued lactose feeding. Analogous results were obtained in human subjects.

With the gradual substitution of other foods in place of milk (lactose) there is a corresponding change in the flora, in which organisms of the bifidus and acidophilus types become relatively fewer and may be almost completely displaced by other forms, namely, those which characterize the flora of the ordinary adult living on a mixed diet which includes very little or no milk or lactose. Among these non-aciduric forms *B. coli* and *B. welchii* have a conspicuous rôle.

That the character of the intestinal flora can be altered almost at will by the regulation of the diet has been shown by us in our extensive experiments on rats and on human subjects, and by various other investigators. Lactose or dextrine, when administered in sufficient amounts, encourages the rapid development of the aciduric types of organisms in the intestine, particularly *B. acidophilus*. Other carbohydrates seem to lack this property, or possess it in only a limited degree.

For some individuals, as small amounts as from 5 to 10 gm. of lactose will suffice. Others will require 100 gm. or more daily, and occasionally a subject may not respond to less than from 350 to 400 gm. of the sugar. The range of susceptibility is indeed very wide.

Lactose is not inverted rapidly in the intestine, and thus a goodly portion of the amount taken reaches the colon where it serves as a favorable medium for the development of *B. acidophilus*. We have held, largely, on the strength of our own observations, that the stimulating effect of lactose is due to the highly favorable environment which it furnishes in the intestine for the development of *B. acidophilus*. More recently Cannon and McNease[2] claim to have shown that the change in flora is due to increased acidity alone. While increased acidity, in certain cases where the amount of lactose feeding has been at least reasonably large (as in Cannon's experiments with rats), may play a decided rôle, we still have reason to believe, from Kopeloff's[3] and our own work, that this is not the sole cause.

B. acidophilus, a characteristic organism of milk-fed infants, can be implanted in the human intestine, and by the use of proper diet made to develop and displace in a large measure the types which are so prominent in persons subsisting on the usual mixed diet, particularly *B. coli* and *B. welchii*.

Years of observations have convinced us that the most effective system of establishing the aciduric type is one in which an appropriate

strain of *B. acidophilus* is administered in large numbers along with appreciable amounts of lactose. These two important agents are combined best in a well ripened milk culture of *B. acidophilus,* now generally known throughout the country as acidophilus milk.

No one can deny certain limitations which acidophilus milk possesses for persons who have a dislike for acidified milk, or milk in any form, and particularly for those who (though rare) have no tolerance for milk proteins. A study of the situation will reveal that the permanent objectors to acidophilus milk are after all relatively few; many of those who have an initial dislike for the product can and do cultivate a taste for it. An acidophilus concentrate which combines the salient features of acidophilus milk would be a welcome substitute. From our own repeated experience with attempts to furnish such a substitute product, we are convinced that the task is extremely difficult, if not insurmountable, despite the almost innumerable efforts made in this direction, owing to the peculiarly delicate nature of *B. acidophilus,* and the exacting requirements of a genuine product.

Acidophilus milk holds a unique position here. It possesses essentially the same food value as plain milk. As a sour milk it should take a prominent place in the rapidly growing practice of supplying acid milk both as a beverage and health drink. It combines in the most satisfactory way the two chief factors upon which a successful treatment depends, namely, massive quantities of viable *B. acidophilus,* and from 4 to 5 per cent lactose, which is so essential in the stimulation and development of this organism in the intestine.

Fortunately, the casein and lactalbumin serve as pronounced buffering agents against the relatively high acidity (hydrogen ion concentration) which is produced by the organism, and which without such buffer influence would rapidly tend to destroy the viability of *B. acidophilus* and thus defeat its chief purpose. The importance of this protective action cannot be overestimated.

An endless amount of harm has been done by so-called acidophilus milk which is impure and contains relatively few organisms of the desired type. Recently manufacturers have been made to realize that this product is a major specialty and that to produce it requires unusual facilities, including a bacteriological laboratory and a trained bacteriologist, and, above all, constant scientific supervision.

From time to time we hear of renewed efforts to produce acidophilus milk in the home. The latest attempt to convince the general public of the practicability of home production is that of Rice.[4] That he does not appreciate the difficulties involved, as any trained bacteriologist would, is revealed when he states that by observing a little

care acidophilus milk may be prepared in the home; and that it is now possible to obtain a pure culture as starter at or through all drug stores. His entire method of production and of purity control rests on unsound principles of asepsis and disinfection, and if followed will lead to untold injury and disappointment. That the problem of acidophilus milk production is essentially one for the bacteriologist, and not the chemist, is again clearly shown in this instance.

It would be presumptuous for me to take advantage of this occasion to extol the virtues of acidophilus therapy. Nor do I wish to enter at this time into the subject of when and how the acidophilus principle should be applied. Such information may be had by consulting publications from our laboratory and from various other sources. Let me state briefly, however, that experiences of the past three or four years lend further support to the principle, and that our confidence in its permanent establishment has not been shaken.

It is to be regretted that often so little intelligence is exercised in applying the acidophilus treatment. In many instances it has been set up as a cure-all, and the user has been led at the outset to believe that ailments which have taken years to develop will be alleviated by one or two days' administration of this biologic agent. There has been a notion also that all ailments will respond to it.

It should be borne in mind that this treatment is indicated only in cases of intestinal disturbances and ailments associated with them, particularly constipation and diarrhea, and their concomitant systemic effects, which are not the result of anatomical or structural derangement. In all instances large quantities of the living organisms must be administered.

Prolonged treatment is necessary in some instances, particularly in cases of chronic constipation. Furthermore, even where relief has become quite apparent, continued or intermittent use of the product is highly desirable over a reasonable period of time. No well authenticated evidence has yet been brought to our knowledge that acidophilus milk has done any harm as such. To persons suffering from diabetes or who do not tolerate milk in any form, it should, of course, not be administered. In all cases of doubt, the family physician is to be consulted.

Perhaps the greatest obstacle to the full realization of acidophilus therapy lies in the multitudinous products which are parading under the name of "acidophilus," but which resemble it only in name. The market has been flooded with preparations ranging in form from tablets, water and oil suspensions, broth and tomato broth cultures and chocolate coated candies, to whey and milk cultures.

Aside from a fairly limited number of commercial milk cultures or brands of so-called acidophilus milk, very few market preparations possess any merit whatsoever as acidophilus products. This has been shown recently by James[6] in his survey of commercial *B. acidophilus* and *B. bulgaricus* cultures and preparations, and by various other scientific observers.

In relatively few instances do so-called acidophilus products contain living bacilli which resemble in any way the organism the package purports to contain. Further than this, some well known preparations contain an organism which bears a general resemblance to *B. acidophilus* but is not identical with it, and according to our observations belongs to an entirely different, but related, group of bacteria. This type of bacillus is employed, we may presume, because it is peculiarly resistant to unfavorable conditions (acidity, drying, and storage) to which *B. acidophilus* is known to have much less resistance.

California has passed a regulation which confers authority upon legally constituted agents to determine and deal with those acidophilus products dispensed within the state which are not genuine. It is hoped that other states will do likewise, and that the federal authorities will soon undertake to control the purity and genuineness of all "acidophilus" preparations sold in interstate commerce, as we have reason to believe they may do.

Finally, there is another subject that bears closely on acidophilus therapy which has recently been brought to the front; namely, the alleged etiological relation between *B. acidophilus* and dental caries. In 1922, Rodriguez[6] and McIntosh, James and Lazarus[7] reported the presence of an organism in dental decay which exhibited some of the properties of *B. acidophilus;* this they named *B. acidophilus-odontolyticus*. More recently other investigators have encountered a similar type of organism in carious teeth, and because it was regarded by them as resembling the Moro bacillus, named it *B. acidophilus*.

Bunting and Palmell[8] unequivocally announced the organism to which they ascribed a definite and direct etiological relationship in dental caries as *B. acidophilus*. Since then Bunting and his associates have made similar statements. We believe that their classification was not based on sufficient scientific evidence, and that they, therefore, violated a very important principle of taxonomy. That the biological position of their organism was of relatively little concern to them, although they expressed such certainty as to its identity, cannot but impress itself on the minds of those who have followed their work and printed statements.

The extensive researches conducted in our laboratory by Mori-

shita,[9] on more than 100 different strains of acid-forming and aciduric organisms isolated from dental caries, together with some of Bunting's strains, have conclusively shown that the aciduric organisms commonly associated with abnormal, decaying teeth are not *B. acidophilus*, but rather distantly related types. Among other things, he states, in his preliminary publication, that "the occurrence of *B. acidophilus* of the intestinal type in dental caries is relatively rare compared with the other aciduric organisms found, and may be regarded as merely adventitious"; and, "the present comparative study seems to the writer to warrant the conclusion that the tooth organisms discussed (by him) constitute a type entirely separate from *B. acidophilus* of the intestinal tract."

Space does not permit me to go into the various points of difference upon which Dr. Morishita based his conclusions.

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Cuba's First National Congress of the Child

THE first National Congress of the Child in Cuba was held in Habana in December, 1928, under the auspices of the government.

The resolutions enacted called for, among other things, the establishment of juvenile courts, courses in dietetics for teachers of primary schools, legislation for prenuptial certificates of health, the appointment of a committee of experts for the study of infant and child feeding, medical supervision over school children, and a number of other child welfare measures.

The congress has also adopted a statement of principles on the rights of the child, called the Declaration of Habana. This is somewhat similar to the Declaration of Geneva on the same subject.

Evaporated Milk and Its Relation to Public Health*

FRANK E. RICE, PH. D.

Executive Secretary, Evaporated Milk Association, Chicago, Ill.

THE use of concentrated and preserved milks has grown tremendously in the past 20 years. In 1908 the amount of milk evaporated, condensed and dried, and consumed in the United States was less than a billion pounds. Now 4⅓ billion pounds per annum is used.

Evaporated milk is prepared by removing a little over half the water, sealing in cans, and sterilizing. It has a creamy consistence and differs from ordinary milk in containing slightly more than twice the amount of solids. The United States Government sets a minimum standard of 7.8 per cent fat and 25.5 per cent total milk solids.

Condensed milk, sometimes called " sweetened condensed milk," is concentrated to about the same degree as evaporated milk, and sufficient sugar added to preserve it.

Dry milk is a powder, and contains not more than 1 or 2 per cent of moisture. It contains no added substance, but often a part or all of the cream is removed. If skimmed, or part skimmed, the label so states.

Evaporated milk, in this country, is not skimmed. Sweetened condensed skimmed milk in cans has appeared from time to time, but most of that now sold in the United States is whole milk, though sweetened condensed skimmed milk in barrels is a common commodity, used in candy and ice cream making.

There are two other forms of concentrated milk of less importance to us here—one sold in bulk, not sterilized, which goes mostly to ice cream manufacturers, and *malted milk,* which contains predominantly products resulting from the malting of grain, only about a third of the total being milk solids.

EVAPORATED MILK

On the basis of milk solids, more unsweetened evaporated milk is consumed in the United States than condensed and dry together

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—nearly twice as much. As many pounds are used as ice cream, twice as many as candy. The industry takes the production of 600,000 cows. Thirty-eight thousand freight cars were required to carry last year's pack.

This would seem to be a commodity that deserves attention from the public health point of view. First, as a milk supply, is it pure, clean and wholesome? Second, is it a nutritious, economical and practical food, one that can be recommended for greater use as a means of promoting the health of a family, a community, and a nation?

Evaporated milk plants are located near the source of supply. In a few hours after the raw milk is produced it has been hauled to the plant and transformed into evaporated milk. It usually takes longer to transport raw milk to the large city and deliver it. For this reason it has been said that evaporated milk reaches the consumer in fresher condition. If " freshness " in foods means that they have not undergone changes brought about by bacteria or enzymes, then canned foods in general can be considered to be the freshest.

Water is removed by heating *in vacuo,* and the concentrated milk is homogenized by forcing it under high pressure through a minute aperture. This reduces the fat globules to a small fraction of their original size. In fact colloidal proportions are attained, since the particles remain distributed throughout the milk, uninfluenced by gravity. Cream does not separate in evaporated milk.

The cans are filled, sealed and sterilized under a steam pressure of about 11 pounds.

SAFETY

Good evaporated milk cannot be prepared from dirty or sour milk. Every packer exercises supervision over the dairies which produce the milk, and its quality is observed when brought to the plant. The farmer must employ sanitary methods, and keep the milk cold until delivered.

The milk within the plant passes rapidly from one stage to the next through an arterial system of sanitary piping, " not touched by human hands."

Sterilization in the can frees the milk of any organisms that could impair its quality or endanger health. As far as the transmission of disease is concerned, evaporated milk gives even more protection than certified milk because the hazard of human error is eliminated.

The answer to the first question is in the affirmative—evaporated milk is safe and dependable.

The transportation of food from the place of production to the

place of consumption, and its storage from the season of plenty to the season of scarcity, are problems of major importance. Economy and safety, chiefly, are involved in the former and the prevention of waste in the latter.

Some maintain that the milk supply of the future will be preserved in cans. This will probably never be wholly true, but it will be a more important factor than at present. The milk shed of the city is constantly widening. There must be a limit, a distance beyond which it is neither economical nor safe to ship raw milk to the consumer. The cost of shipping 7 parts of water with 1 part of food, and of handling such an extremely perishable food, cannot but take its toll in limited consumption.

There are plenty of data to prove that the evaporated milk industry is fulfilling the requirements of an economical milk supply. Evaporated milk produced within 100 miles of Chicago is being delivered in that city for 20 per cent less than the milk delivered in bottles. Indeed, Wisconsin milk is delivered in Florida for much less than the cost of market milk in that state. By 43 years of scientific effort, the industry has learned how to evaporate milk efficiently and economically; refrigeration of the product in transit is not necessary; there is less water to transport; no bottles to break; no high wages to pay to union milk wagon drivers.

Evaporated milk production acts as a stabilizer of the whole dairy industry. It continues throughout the year, but the peak comes at the height of the milk flow. At this time, when there is a raw milk surplus, waste would occur, and it is likely that the farmer would receive a ruinous price were it not possible to transform the surplus into such less perishable products as evaporated milk, butter and cheese.

HOME ECONOMICS

If we agree that it would be for the betterment of the public health to increase milk consumption, it would seem to be wise, as one part of our educational program, to find new ways of putting milk into the diet, rather than to expend all our efforts in urging the drinking of more milk. There is a limit to the amount of milk people will drink; a quart per person per day probably can never be reached.

Many cooked foods require milk, and many could be made more appetizing as well as more nourishing by the inclusion of milk. Evaporated milk is particularly well adapted for this.

Nutritional workers have long maintained that ice cream would be a better food if it contained more of all the solids of whole milk and less fat than the government requires. Ice cream is consumed

more largely in summer and in warm climates where foods of high caloric value are undesirable. It is frequently taken as a dessert after an entirely adequate meal. A low fat ice cream with fine texture can be made from evaporated milk. Due to the physical character of the fat and protein only small ice crystals are permitted to form in freezing. Ice cream and candy manufacturers have long recognized the influence of evaporated milk on texture.

For artificial feeding of infants it is necessary to have milk that is safe, digestible, uniform, and nutritious. Evaporated milk fulfils these qualifications. The curd is soft, resembling that of human milk, because of the physical changes in the casein due to homogenizing and sterilizing.

NUTRITIVE VALUE

The statement has often been made that when milk is heated there is some loss of mineral. A slight precipitation on the sides of the container has been noted where large quantities of milk are heated. From the point of view of colloid chemistry, there is some evidence of a rearrangement of mineral combinations in milk when heated. There is no evidence that the new combination of calcium, phosphorus and other elements is not just as soluble in the gastric juice and just as assimilable as the original combination. It has been demonstrated that the calcium and phosphorus of evaporated milk are fully assimilable.

With the exception of C, the vitamins are present in apparently the same amounts as in raw milk. Not only does the casein of evaporated milk form a more fluid curd, but it is more readily hydrolyzed by the digestive enzymes, and assimilated.

The fat is more highly emulsified in consequence of the homogenization. Since emulsification is the first step in fat digestion, evaporated milk should prove particularly acceptable to infants or those with deranged digestive functions.

There is evidence that an individual who reacts anaphylactically to raw milk may take foods containing evaporated milk with impunity. The heat of sterilization apparently renders the sensitizing constituents of the milk inactive.

A dietetic experiment of magnitude proving the value of the concentrated milks in public health was the work of the American Relief Administration in Europe during the World War. Herbert Hoover in an address before the World's Dairy Congress made the following statement:

> It is perhaps interesting to note that this organization and its allied organizations exported from the United States, for the use of those children, upwards of

500 millions of pounds of condensed (evaporated and condensed) milk during the period of the war and reconstruction. It could be very well said that the saving of millions of children was accomplished only by virtue of the strength, the resilience, of the American Dairy Industry.

SUMMARY AND CONCLUSIONS

The marked increase in the use of the concentrated milks indicates their importance from the public health point of view. One and one-quarter billion pounds per year of unsweetened evaporated milk is consumed in our country.

Canned foods of all kinds have received a clean bill of health. The methods of production are above reproach, and any loss in nutritive value in canning is negligible.

The preparation of evaporated milk from good, clean milk near the source of production, and the promptness with which it is evaporated, are among the factors that make it the safest supply. From the economic point of view, evaporated milk is the most efficient, and this industry assists in stabilizing the whole dairy industry.

The average consumption of whole milk cannot be brought to the optimum by alone urging the drinking of milk. The use of milk in prepared foods can be made a more important factor than it is now. Evaporated milk is the logical whole milk supply. Its concentration, smoothness and flavor admirably adapt it to this purpose. Its convenience makes for increased usage.

Infants require a safe, digestible, uniform and nutritious milk—qualities found in evaporated milk.

There is no important loss in nutritive value when raw milk is evaporated. The protein and fat are made more digestible.

The public health value of evaporated, and other concentrated milks, was fully demonstrated during the World War.

Evaporated milk is no longer to be recommended only when raw milk is not to be had. It has a definite place in the nutritional economy of the family and the nation.

NOTE: The references presented with this paper may be obtained by corresponding with Dr. Rice.

DISCUSSION

McKIM MARRIOTT, M. D.

Dean, Washington University Medical School, St. Louis, Mo.

FROM the theoretical standpoint, evaporated milk would appear to possess distinct advantages for infant feeding. Chief among these are absolute sterility, easy digestibility on account of the heat alteration of protein, constant and known composition, and availability, and the ease with which feeding formulas

may be prepared. It is difficult to see why it has not had a more extensive use for this purpose. The prejudice against canned foods, and confusion with sweetened, condensed milk, seem to have been the important factors in limiting its use. It has been recommended by some pediatricians for use in the treatment of infants with special conditions, but has not been generally advocated as a routine food for normal infants. Fresh milk has apparently been considered superior, but no good reasons for this have been brought forward.

Evaporated milk possesses so many advantages that it seemed desirable to determine, by a practical test, whether it possesses any disadvantages, and whether it can safely and advantageously be substituted for fresh milk in the routine feeding of infants.

During the past 15 months we have fed 668 infants on formulas prepared from evaporated milk, the composition of the final product being, in each instance, approximately the same as the individual would have been receiving had fresh milk been used. The length of time the formulas were fed varied from 2 weeks to 1 year, the average being 3½ months. In the majority of normal infants, feeding with evaporated milk was started during the first week of life. In addition, there were included 75 sick infants in a hospital service and out-patient department. These were suffering from a variety of conditions, including undernutrition, diarrhea, pyloric stenosis and various infections. Seven premature infants weighing from 1 to 5 pounds received evaporated milk as the exclusive food. The 668 infants were compared with 658 observed at the same time who received fresh cow's milk mixtures, or were exclusively breast fed, who came within approximately the same age limits, and included approximately the same distribution between normal infants and those suffering from various diseases.

Of the newly-born, 80 per cent regained the birth weight by the end of 14 day, as compared with 66 per cent in the control series. Of the normal infants followed for a period of months, the average gain in weight was 23.4 grams per day, as compared with 25.5 grams in the control series. The weight of those fed on evaporated milk at the end of the period of observation averaged 100.4 per cent of the theoretical normal weight for the respective ages, although the average weight at the time the feeding was begun was but 96.3 per cent of the theoretical, these figures being based upon the average weight of breast fed babies.

Of the hospital cases, which included all of the more seriously ill and difficult feeding problems, the average gain in weight was 18.5 grams per day as compared with 17.4 in the controls. There was no evidence that the development of those fed on evaporated milk was retarded. Dentition, sitting and walking occurred at the average normal time. There was no evidence of lack of resistance to infection. Although the observations extended over two summers, it was noteworthy that the infants fed on evaporated milk were, as a group, not subject to fermentative diarrheas. One of these developed eczema and two in the control series. Infants fed on evaporated milk for long periods were examined clinically and radiologically for evidence of rickets and none was found, nor was there any clinical evidence of scurvy. It should be noted that all received daily doses of cod liver oil and orange juice.

In addition to our own observations, a questionnaire was sent to a group of physicians who had been graduate students in our clinic, most of whom were practicing in rural districts, inquiring as to their experiences with the use of evaporated milk in the feeding of infants. To date no unfavorable replies have been received. A number of them have used evaporated milk almost exclusively.

Some stated that they considered it superior to fresh milk in most cases for well babies, and in all cases for the sick. Others commented on its superiority for use in rural districts, and among the poor who could not obtain suitable fresh milk, or did not have proper refrigeration. Some stated that they rarely saw the patients again after putting them on evaporated milk, as they did not thereafter suffer from feeding difficulties.

From this study it may be concluded that evaporated milk not only has no disadvantages but has considerable advantages over fresh milk for the feeding of both normal and sick infants.

Housing Betterment

THE Pennsylvania Legislature, which has just closed its session, worked for and against housing betterment, says the Philadelphia Housing Association.

Its contribution to housing progress is the Woodward Zoning Bill, introduced by Senator George S. Woodward, which, after a rather disheartening experience, passed the House and was signed by Governor John S. Fisher.

The Woodward Bill, which gives Philadelphia permission to adopt a zoning ordinance, will stand comparison with the zoning enabling acts on the statute books of over 30 states. It is modeled after and is practically a duplicate of the Standard State Zoning Enabling Act of the U. S. Department of Commerce. In addition, it authorizes a bureau of zoning, establishes penalties, and contains a validity section to care for adverse court decisions, if such should be rendered against any of its provisions. In signing this bill Governor Fisher has given Philadelphia the most far-reaching legislation of beneficial character which has passed the General Assembly in many years.

Prior to this action of the Governor, the City Council of Philadelphia, at the request of the Mayor, passed a resolution endorsing the Woodward Bill, and three Councilmen appeared at the hearing in Harrisburg and requested the enactment of the bill into law. Moreover, while this authority was being granted by the State Legislature, the councilmanic body enacted a companion piece of legislation creating a city planning commission. The agitation for this commission was begun some months ago by local organizations which persuaded the Mayor to call together 300 citizens to advise on the plans and scope of a planning commission. Following the enthusiastic reception of the proposal, Mayor Mackey prepared and sent to City Council an ordinance creating a committee of 15 members, which the Council passed in record time.

The outlook for the passage of a zoning ordinance and the appointment of a city planning commission for Philadelphia is most gratifying today. To all appearances, the efforts of the Housing Association for many years to further these two projects are about to reach fruition.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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ANOTHER ARGUMENT FOR PASTEURIZATION

SEPTIC sore throat was introduced to us in America, so to speak, by Boston, Brookline and Cambridge, in the spring of 1911, and since that time, recurring epidemics have taken a heavy toll of raw milk users. In spite of the various publications on the subject and the teaching of milk experts and sanitarians generally, we cannot escape the conclusion that the disease is too little considered, and that even health officers are not as much awake to the necessities of the case as they should be, though we express this opinion with full sympathy for the legal and technical difficulties which confront many of them in their official work.

The latest epidemic to attract wide attention occurred in Lee, Mass., in June and July, 1928. Lee is a town of 4,000 inhabitants. Within approximately 2 weeks, 950 people suffered from septic sore throat, and 48 died as a result. The outbreak was carefully studied epidemiologically and bacteriologically, so that we have an exact and clear account of it. A recent number of the *New England Journal of Medicine*[1] devotes considerable space to the matter, and gives as well an admirable historical review of the disease, going back as far as authentic accounts can be found. More than 60 epidemics have been recorded, involving more than 30,000 cases. From 1911 to 1928, inclusive, there have been in Massachusetts alone, 1,468 cases of typhoid fever, 74 of diphtheria, 1,147 of scarlet fever, and 3,986 of septic sore throat, attributed to milk as the carrier. During the same period, there have been only 369 cases of water-borne typhoid fever.

We cannot do better than to emphasize the points made by Bigelow and White,[1] who point out that in spite of our knowledge and insistence on protection of water supplies, our attempts at enforcing sanitary laws in regard to milk often meet with discouragement and

lack of sympathy on the part of consumers, and with distinct opposition on the part of producers and distributors.

Septic sore throat is due to a hemolytic streptococcus, usually of the *epidemicus* type, and is practically exclusively a milk-borne disease. Fortunately the streptococcus is comparatively easily killed by heat, so that even ordinary pasteurization will render a milk supply safe.

Among other important features brought out in the investigation of the Lee epidemic, two are of especially practical value—the apparent responsibility of a single cow, and the fact that an infected quarter may not show gross lesions, and produce milk of apparently normal character. One cow in an otherwise healthy herd showed distinct disease in the left front quarter, the milk from which had been excluded. However, the hind quarter on the same side, though apparently healthy, and giving milk of apparently good quality, was found to contain great numbers of the *S. epidemicus*. The animal was kept under observation for 2 months, during which time samples of milk were frequently examined. The two right quarters remained normal in appearance and negative for *S. epidemicus*. We must recognize that dairymen not infrequently use the milk from one or more quarters of a diseased udder.

Our only protection at present against this, as well as against other milk-borne diseases, is proper pasteurization. Once again, we wish to insist that with the exception of certified milk, all market milk should be pasteurized. In this lies our only safety against milk-borne diseases.

REFERENCE

1. Epidemic Septic Sore Throat—White, Benjamin. Part I. Historical Review; Holmes, May Salona. Part II. Study of the 1928 Epidemic in Massachusetts; Bigelow, George H., and White, Benjamin. Part III. Review of 1928 Epidemic in Massachusetts; *New Eng. J. Med.*, 200, 16: 797–809 (Apr. 18), 1929.

A PUBLIC HEALTH AWARD AT TULANE UNIVERSITY

THERE has been established at Tulane University, New Orleans, La., an award to be known as the " Geiger Medal," to be granted yearly to that student of the university, either senior or graduate, who prepares the best thesis on some phase of public health of particular interest to the southern states or countries contiguous to them.

The medal has been accepted by the Board of Administrators through President Dinwiddie. For the present session, the award will be made by a committee consisting of the head of the Department of English in the College of Arts and Sciences as chairman, the Dean of the School of Medicine, Professors Musser and Faust of the School of

Medicine, and Professor E. S. Hathaway of the College of Arts and Sciences.

We cannot but rejoice at this recognition of public health by our leading southern university.

The medal is named in honor of Dr. J. C. Geiger, at present Associate Professor of Epidemiology in the Medical School of the University of California. Dr. Geiger is well known for his epidemiological studies in connection with the work on botulism done by the U. S. Public Health Service with the Departments of Hygiene of the University of Chicago and the University of California. He was Assistant Health Commissioner of the City of Chicago, and was one of those who, to all intents and purposes, was dropped by Mayor Thompson.

THE THIRD CONFERENCE ON PUBLIC HEALTH

THE Third Annual Conference on Public Health, called by the American Medical Association, met in Chicago, Ill., March 29 and 30. The first day was devoted to a discussion of coöperation between official and voluntary health agencies and the medical profession, in the promotion of public health. This program was outlined by the committee appointed by the 1928 Conference.

The second day the work of the Hygienic Laboratory, especially research, was described, followed by a review of our knowledge of undulant fever and its relation to public health.

It will be remembered that much of the 1928 meeting was devoted to a somewhat heated discussion of the differences which had arisen over the conduct of a demonstration, some physicians believing themselves to be adversely affected. The meeting ended, however, with a sincere attempt on the part of all to reach an understanding, and to establish friendly relations. The 1929 meeting was largely devoted to furthering this same object.

There can be little doubt that some voluntary agencies have in the past blundered. They have invaded fields which have for many years been in the hands of physicians, and have not always been tactful, nor have they always brought to their aid the best medical advice. The resident physicians, and to some extent the medical profession in general, have resented these invasions. Irritation and opposition have developed which could almost certainly have been avoided by the exercise of tact and judgment—in other words, application of ethics.

The medical profession has for years recognized and welcomed public health work in the control of water and milk supplies, sewage

disposal, and even vaccination against smallpox. With the increasing number of diseases which can be prevented by immunization, a new factor has entered, in which the treatment of the individual, which has been a medical function, has been invaded. During these campaigns by voluntary agencies, much of the propaganda work has been done by nurses and others, perhaps physicians, brought in from the outside. There can be no doubt that the opposition of local physicians is based largely upon what they consider outside interference, though in some cases there is fear of having their means of living taken away from them by the prevention of disease.

Some foundations have recognized that their demonstrations have led the public to expect immunization free or at a minimum cost. When the campaign is over, the public is left high and dry, as far as the foundation is concerned, and must pay for further work, unless, as is sometimes the case, official health agencies take it over.

We believe that the more education there is along the lines of public health and preventive medicine, the more work the physician of the community will have to do, though there may be a period of readjustment, during which the private physician suffers.

A similar controversy arose over the establishment of official public health laboratories, those conducting private laboratories feeling that their work would be taken away from them. We do not pretend to have made an exhaustive survey of this matter, but many observations have convinced us that private laboratories are more numerous and doing a greater amount of work than ever before, and cannot escape the conviction that the official laboratories have trained the public to demand such service.

Essentially the same factors are involved in the relation between voluntary agencies and private physicians. If a voluntary or even an official agency sends bumptious men and women into the field, trouble will inevitably result. On the other hand, it has been abundantly proved that where tact is shown, physicians, with the exception of a few unfortunate characters always to be found, are willing and eager to coöperate and to acquire the newer knowledge. In this connection, we wish we could give the experiences of a certain foundation which has avoided the errors discussed.

The voluntary agency and the foundation are here to stay, whether we like it or not. Many of them are in the hands of non-medical executives, some of whom have judgment and tact, while some are devoid of these necessary qualities. Some are capable of learning, some apparently are not. We are strong in our belief that a working basis will be found, and that cordial relations will be established, not

only between voluntary and official health agencies, but between them and the medical profession. As well put, in one of the papers at the conference:

> The voluntary agency can best meet its responsibility by stimulating the individual citizen to insist upon a modern health service from his physician, by helping the physician to enlarge his scope of service and render a better service, and by helping the official agency to a stronger and more secure place in the governmental scheme.

It was finally agreed, on motion, that the chairman be requested to appoint a committee to consider the papers presented, and to draft such suggestions as might seem desirable for consideration at the next conference, all carrying the general idea of coöperation.

A NEW ASSOCIATION

ONE is always inclined to groan over the formation of a new society. Already the professional man is burdened with the number to which he belongs or should belong. It is impossible to attend all of the meetings, and difficult to keep up with the literature put out by the various societies; yet now and then there seems to be a real need for a new one, and this has been recognized by the foundation of the American Mouth Health Association, incorporated in Minnesota.

The avowed purposes of the association are to inform the public of the importance of mouth hygiene; to establish a central bureau of mouth health education with local branches throughout the country; to promote the teaching of healthful living, with especial reference to the mouth and teeth; and to give support to other health and welfare agencies.

An advisory board has been appointed, the first meeting of which was held in Rochester, Minn., May 17 and 18, where the prospectus of the association was discussed, stock taken, and outlines for the future tentatively determined. Some extremely interesting studies made at the Mayo Clinic were presented, illustrated with photographs, and the members were given the opportunity of seeing the experimental animals.

The importance of oral hygiene is being more and more recognized. It was regarded for a long time as a specialty in which only the dentist was interested, and his work was considered to lie largely in the correction of defects and repair of damage already done. The influence of the teeth and the mouth on the general health has not been recognized until comparatively recently, and even now its significance is not fully understood, though an imposing number of organic as well as functional derangements are known to have their

origin in, or to be adversely influenced by, infections of the gums, teeth or tonsils. With the study of focal infections there came a veritable orgy of tooth pulling, against which there is now a revulsion of feeling, though physicians are still referring cases to dentists more than formerly, and remarkable restorations to health follow the correction of defects and the removal of focuses of infection.

It was to be expected that the teeth would not escape attention in the intensive study of vitamins which has been going on. This in turn has brought a renewal of our interest in foods and diets in general.

We cannot but feel that there is an open field for this new association, and wish it great success. There is certainly something wrong with our habits when the vast majority of people—young and old—suffer from defective teeth and a train of disorders resulting therefrom. Our teeth have not kept pace with our changes in occupation and methods of living. We have perhaps become too much civilized. We live in an age of prepared and packaged foods, pre-chewed and often pre-digested. Will not a return to nature improve matters? The Sybarites disappeared from the world.

SAMUEL H. GILLILAND, V. M. D., M. D.

THE death of Dr. Samuel H. Gilliland on May 27, at the age of 51, removes a notable figure from the biological manufacturing world.

For many years he was associated with the late Dr. Leonard Pearson in the work of the State Live Stock Sanitary Board of Pennsylvania, and held a number of offices requiring expert knowledge as well as great executive ability, all of which he filled with credit to himself and advantage to those whom he served. He held the degrees of Doctor of Veterinary Medicine and Doctor of Medicine, both obtained from the University of Pennsylvania while he was carrying on his work in the laboratory of the State Live Stock Sanitary Board. He had made several trips to Europe for the purpose of study.

In Pennsylvania he held successively the offices of Director of the Laboratory of the State Live Stock Sanitary Board, Director of the Laboratories of the State Board of Health, and State Veterinarian. During the World War he was Director of the Laboratory for the training of veterinarians situated at the University of Pennsylvania, holding the commission of Major in the Medical Corps of the U. S. Army. Here veterinarians studied not only the contagious diseases of animals, but also serology and laboratory diagnostic work.

Dr. Gilliland was one of the pioneers in the study of immunity against tuberculosis, and, with the late Dr. Leonard Pearson, published, in 1902, " Some Experiments upon the Immunization of Cattle

against Tuberculosis." While similar work had been done before, we believe this was the first in the world which was carefully controlled by post-mortem observation and microscopical examination of the tissues. Subsequently Dr. Gilliland published several articles under his own name on the same subject. He also carried out extensive immunization experiments on some farms breeding only the highest class of cattle for the production of certified milk.

Dr. Gilliland was a member of our Association, and a Fellow; a member of the American Medical Association; Philadelphia Pathological Society; Philadelphia County Medical Society; University Club; Medical Club; National Tuberculosis Association; American Veterinary Medical Association; and the United States Live Stock Sanitary Association.

PROPOSED ENTERTAINMENTS AND TRIPS IN MINNEAPOLIS

Drive through Lake district to Glen Lake Sanatorium. Inspection. Buffet luncheon at Sanatorium (2¼ hours)

Dedication Exercises
University Public Health Pavilion
Luncheon (5 hours)

Drive to University Main Campus and Agricultural Campus (2½ hours)

Trip to Hospitals and Institutions for care and rehabilitation of the handicapped (4 hours)
- a. Michael Dowling School
- b. Minnesota Hospital for Crippled Children
- c. Shrine Hospital for Crippled Children
- d. Arthur J. Gillette State Hospital for Crippled Children

Visit through Social Service and Health Agencies (2 hours)
- a. Citizens' Aid Building
- b. Minneapolis Division of Health
- c. Lymanhurst School and Clinic
- d. Minneapolis General Hospital

Visit to the University Medical School, University Hospitals (2 hours)
- a. Cancer Institute
- b. Todd Memorial Clinic
- c. Institute of Child Welfare

Trip to the Water Purification Plants at Fridley Park and Columbia Heights (3 hours)

Trip to the Milk Producing, Pasteurizing, and Distributing Plants (3 hours)
- a. Franklin Co-Operative Creameries
- b. Hockney Dairy Farm, etc.

Trip to the Minneapolis Flour Mills (2 hours)
- a. Inspection of Food Products
- b. Luncheon

For visiting ladies
(Two alternative drives, 2 and 3 hours respectively)
Drive around the lakes and boulevards surrounding the city (a. or b.)
- a. Tea at Minneapolis Art Institute
- b. Tea at Woman's Club

Special Trip to the Mayo Clinic and the Mayo Foundation, Rochester, Minn., fast Railway service
- a. Research Health Clinic
- b. Luncheon

Opening Session—Monday, September 30, 8:00 P.M.—Nicollet Hotel
- a. Program
- b. General Reception
- c. Dance

Banquet—Thursday, October 3, 7:00 P.M.—Nicollet Hotel
- a. After dinner program
- b. Dance

A possible trip to the St. Paul Hospitals and Institutions (3 hours)

PRELIMINARY PROGRAM OF THE FIFTY-EIGHTH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Minneapolis, Minn., September 30–October 5, 1929

DELEGATES are urged to consult the Final Program, at the meeting, for information as to the exact time and place of sessions. The General Sessions will be held at the Hotel Nicollet. Section and other meetings will be held in the Municipal Auditorium. Morning sessions will be at 9:30; luncheon sessions at 12:30; afternoon sessions at 2:30; dinner sessions at 6:30; and evening sessions at 8:00.

General Sessions

First Session—Monday Evening

Addresses of Welcome

Address of the President of the American Public Health Association. George W. Fuller, Fuller & McClintock, New York, N. Y.

Address of the President or a Representative of the American Child Health Association.

Reception and Dancing

Banquet—Thursday Evening

No Title. George E. Vincent, Ph.D., President, The Rockefeller Foundation, New York, N. Y.

Dancing

Joint Sessions

CHILD HYGIENE SECTION AND AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

First Session—Monday Afternoon

The Rôle of the School Physician in a School Health Program. Charles H. Keene, M.D., Professor of Hygiene, University of Buffalo, Buffalo, N. Y.

Report of the Committee on Sickness Absence Records. *Chairman*, Don W. Gudakunst, M.D., Director, School Health Service, Health Department, Detroit, Mich.

The Value of a Survey of Senior Grades in Primary Schools in an Attempt to Evaluate the Present School Health Service. J. E. Davey, M.D., Chief School Medical Officer, Hamilton, Ont.

Training for School Health Workers. Sven R. Lokrantz, M.D., Medical Director, Los Angeles City Schools, Los Angeles, Calif.

Second Session—Tuesday Afternoon

School Health Work. How It May Be Improved. JOHN L. C. COFFIN, M.D., School Physician, Los Angeles City Schools, Los Angeles, Calif.

A Practicable Program of School Health Supervision in Secondary Schools. CHARLES H. KEENE, M.D., Professor of Hygiene, University of Buffalo, Buffalo, N. Y.

Suggested Measures for Increasing the Coöperation between the Family Physician, the Parent and School Health Staff. MARY E. CRAWFORD, M.D., Chief School Medical Officer, Winnipeg, Man.

Recording of Medical Examinations of School Children Leading to Credits. FRANCIS E. HARRINGTON, M.D., Commissioner of Health, Minneapolis, Minn.

CHILD HYGIENE AND PUBLIC HEALTH EDUCATION SECTIONS

First Session—Thursday Afternoon

Health Teaching in the Elementary Schools. IDA M. HASKINS, Director of Health Education, Public Schools, Mansfield, O.

The Rôle of the Classroom Teacher in a School Health Education Program. ANNE L. WHITNEY, Director of Health Education, American Child Health Association, New York, N. Y.

Training of Teachers for Health Education Work. ELMA ROOD, Director of Nursing, Peabody College for Teachers, Nashville, Tenn.

Second Session—Friday Afternoon

The Rôle of a School Superintendent in a School Health Program. R. G. JONES, Superintendent of Schools, Cleveland, O.

Discussion

Procedures for Inter-relating Health Teaching and Health Administration. WILLIAM DEKLEINE, M.D., American Red Cross, Washington, D. C.

Discussion

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS

Friday Morning

Community-Wide Child Hygiene Program Including Official and Non-Official Health Agencies and the Medical Profession. MARY RIGGS NOBLE, M.D., Chief Preschool Division, Bureau of Child Health, State Department of Health, Harrisburg, Pa.

The Nurse's Message of Child Health to the Family and How She Can Get It Across under Varying Conditions. HELEN C. PECK, R.N., Executive Secretary, Infant Welfare Society, Minneapolis, Minn.

Discussion

How Can the Nurse Help the Health Officer to Get His Message Across?

From the Standpoint of the City—HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

From the Standpoint of the County—H. S. MUSTARD, M.D., Assistant to the Commissioner, State Department of Health, Nashville, Tenn.

Elements in the Home Controlling Infant Welfare Activity. AMELIA GRANT, R.N., Director, Bureau of Nursing, Department of Health, New York, N. Y.

FOOD, DRUGS AND NUTRITION AND PUBLIC HEALTH ENGINEERING SECTIONS

Thursday Afternoon

Low Per Capita Milk Consumption—A National Nutritional Problem. R. S. CRAIG, Director, Bureau of Chemistry and Food, City Health Department, Baltimore, Md.

The Significance of Thermophilic Bacteria in Market Milk. L. A. ROGERS, D.Sc., In Charge, Research Laboratories, Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

Discussion. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

Results Achieved by a State-Wide Milk Sanitation Program. E. L. BISHOP, M.D., State Health Commissioner, and W. H. HASKELL, In Charge, Milk Sanitation, State Department of Health, Nashville, Tenn.

Discussion

A Practical Definition of Pasteurization. LESLIE C. FRANK, Sanitary Engineer in Charge, Milk Investigations, U. S. Public Health Service, Montgomery, Ala.

Discussion. GEORGE W. GRIM, V.M.D., Milk Control Officer, Ardmore, Pa.

LABORATORY AND EPIDEMIOLOGY SECTIONS

Friday Afternoon

The Common Cold, and How It Is Being Studied Epidemiologically. W. H. FROST, M.D., Johns Hopkins University, Baltimore, Md.

Field Studies in Respiratory Infections. WILSON G. SMILLIE, M.D., School of Public Health, Harvard University, Boston, Mass.

Bacteriological Findings in Pneumonia and Their Bearing on Epidemiology. WILLIAM H. PARK, M.D., Director of Laboratories, Department of Health, New York, N. Y.

HEALTH OFFICERS AND EPIDEMIOLOGY SECTIONS

Wednesday Afternoon

Opportunity and Status of Epidemiological Service in State and City Health Departments. JOHN A. FERRELL, M.D., International Health Board, New York, N. Y.

Practice and Results of the Epidemiological Work of the State Department of Health of California. W. H. KELLOGG, M.D., or JOHN N. FORCE, M.D., University of California, Berkeley, Calif.

Milk-Borne Septic Sore Throat and Scarlet Fever. CLARENCE L. SCAMMAN, M.D., Assistant State Commissioner of Health, Newtonville, Mass.

PUBLIC HEALTH ENGINEERING AND LABORATORY SECTIONS

Thursday Morning

The Use of Synthetic Dilution Waters for Bacteriological and Oxygen Demand Determinations. E. J. THERIAULT and C. T. BUTTERFIELD, Stream Pollution Investigations Station, U. S. Public Health Service, Cincinnati, O.

The Treatment of Creamery Wastes. L. F. WARRICK, State Sanitary Engineer, State Board of Health, Madison, Wis. (*Stereopticon Illustration.*)

Administrative Control of Waterways Pollution. W. L. STEVENSON, Chief Engineer, State Department of Health, Harrisburg, Pa.

The Administrative Significance of Proposed Changes in Standard Methods of Water Analyses. JOHN F. NORTON, PH.D., Director of Laboratories, Department of Health, Detroit, Mich.

Discussion. J. J. HINMAN, JR., University of Iowa, Iowa City, Ia., and ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

PUBLIC HEALTH ENGINEERING AND CONFERENCE OF STATE SANITARY ENGINEERS

Dinner Session—Tuesday Evening

SECTION SESSIONS

LABORATORY

First Session—Tuesday Morning

The Streptococcus of Septic Sore Throat. WILLIAM D. FROST, M.D., R. C. THOMAS, MILDRED GUMM and MYRTLE SHAW, University of Wisconsin, Madison, Wis.

The Opsonic Method for Identification of Scarlet Fever Streptococci—Its Applicability for the Detection of Carriers. RUTH TUNNICLIFF, M.D., Chicago, Ill.

Anti-Streptococcus Serum in Scarlet Fever. A. B. WADSWORTH, M.D., State Department of Health Laboratory, Albany, N. Y.

The Relationships of the Hemolytic Streptococci Causing Erysipelas. ANNA W. WILLIAMS, M.D., Research Laboratory, Department of Health, New York, N. Y.

Meningitis. JOHN F. NORTON, PH.D., Director of Laboratories, Department of Health, Detroit, Mich.

Second Session—Wednesday Morning

Report of the Committee on Training and Personnel. THOMAS G. HULL, PH.D., State Department of Health, Springfield, Ill.

Standardization of the Wassermann Test. RUTH GILBERT, M.D., Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Report of the Committee on Standard Methods. *Chairman,* EDWIN O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Report of the Committee on Abstracts in the Journal. *Chairman,* C. C. YOUNG, D.P.H., Department of Health Laboratory, Lansing, Mich.

Report of the Committee to Confer with the Association Committee on Dairy Products. *Chairman,* ROBERT S. BREED, PH.D., New York Agricultural Experiment Station, Geneva, N. Y.

Mediterranean Fever as Observed in the Mediterranean Countries. I. FOREST HUDDLESON, D.V.M., Michigan State College, East Lansing, Mich.

Tularemia. R. G. GREEN, M.D., and E. M. WADE, State Board of Health, Minneapolis, Minn.

The Study of Cultures of Monilia Isolated from Sputum. RUTH GILBERT, M.D., and W. M. GROESBECK, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

The Sanitary Significance of Thermophilic Bacteria in Milk. ROBERT S. BREED, PH.D., New York Agricultural Experiment Station, Geneva, N. Y.

The Applicability of the Direct B. Coli Aerogenes Count Obtained with Cyanide Citrate Agar to the Scoring of Shell Fish. FRED O. TONNEY, M.D., City Hall, and RALPH E. NOBLE, Chicago, Ill.

HEALTH OFFICERS

First Session—Tuesday Afternoon (*Closed Session*)

Health Department Administrative Problems, such as Salaries, Hours of Work, Vacations, Sickness Leave, Pensions, and Other Rules and Regulations. GEORGE C. RUHLAND, M.D., Health Commissioner, Syracuse, N. Y.

Discussion

National Health Contest of the U. S. Chamber of Commerce. JOHN L. RICE, M.D., Health Officer, New Haven, Conn.

Discussion. Representative of the U. S. Chamber of Commerce.

The Appraisal Form. W. F. WALKER, D.P.H., Field Director, Committee on Administrative Practice, American Public Health Association, New York, N. Y.

Discussion

Discussion of the Report of the Committee on Coöperation, Development and Finance. LOUIS I. HARRIS, M.D., General Director, Public

Health Service, National Dairy Products Corporation, New York, N. Y.

Dinner Session—Tuesday Evening (*Closed Session*)

The Place of the American Public Health Association in Public Health and the Part the Health Officer Can Play. GEORGE W. FULLER, Fuller & McClintock, New York, N. Y.

Second Session—Thursday Morning

PROGRESS REPORTS FROM THE COMMITTEE ON ADMINISTRATIVE PRACTICE:

a. The Care of Communicable Diseases in General Hospitals. D. L. RICHARDSON, M.D., Superintendent, Providence City Hospital, Providence, R. I.

b. Health Department Record Forms. GEORGE C. RUHLAND, M.D., Health Commissioner, Syracuse, N. Y.

c. High Points in County Health Work. C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn., and E. L. BISHOP, M.D., State Health Commissioner, Nashville, Tenn.

Reporting of County Health Work. H. S. MUSTARD, M.D., Assistant to the Commissioner, State Department of Health, Nashville, Tenn.

Discussion. DOUGLAS L. CANNON, M.D., State Health Commissioner, Montgomery, Ala.

Training of Health Officers. JOSEPH W. MOUNTIN, M.D., State Department of Health, Nashville, Tenn.

Discussion. M. E. BARNES, M.D., Commissioner of Health, Greenville, O.

VITAL STATISTICS

First Session—Tuesday Afternoon

SPECIAL SESSION ON CANCER

Announcement of the Purpose of the Session. *Chairman*, GEORGE H. VAN BUREN, Metropolitan Life Insurance Company, New York, N. Y.

The Need for Cancer Morbidity Statistics. FRANCIS C. WOOD, M.D., Professor and Director of the Institute of Cancer Research, Columbia University, New York, N. Y.

Problems of Cancer Mortality Statistics. H. E. ROBERTSON, M.D., Professor of Pathology, The Mayo Foundation, University of Minnesota, Rochester, Minn.

Economic Aspect of the Cancer Problem. RAYMOND PEARL, PH.D., Director, Institute of Biological Research, Johns Hopkins University, Baltimore, Md.

What Can Be Done to Give Cancer Statistics a Greater Popular Appeal?

Second Session—Wednesday Morning

Section Business.

Report of the Committee on Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List.

Chairman, HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

Report of the Committee on Public Health Climatology. *Chairman,* E. W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

Report of the Committee to Coöperate with the National Safety Council in Preparing Forms for Additional Information Regarding Accidents. *Chairman,* W. THURBER FALES, Sc.D., State Registrar, State Board of Health, Montgomery, Ala.

Report of the Committee on Registration Affairs. *Acting Chairman,* T. F. MURPHY, M.D., U. S. Bureau of the Census, Washington, D. C.

Some Difficulties in the Collection of Records. STEWART G. THOMPSON, D.P.H., Director, Bureau of Vital Statistics, State Board of Health, Jacksonville, Fla.

Discussion. W. A. DAVIS, M.D., Registrar, Bureau of Vital Statistics, State Department of Health, Austin, Tex.

The Preparation and Publication of Basic Statistical Tables. L. W. HUTCHCROFT, Statistician, State Board of Health, Madison, Wis.

Discussion. F. M. REGISTER, M.D., Director, Bureau of Vital Statistics, State Board of Health, Raleigh, N. C.

No Title. SHIRLEY W. WYNNE, M.D., Commissioner of Health, New York, N. Y.

Third Session—Wednesday Afternoon

Report of the Committee to Aid Completion of the Registration Area. *Chairman,* LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Report of the Committee on Proper Allocation of Records. *Chairman,* J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

The Need of Better Occupation Returns on Death Certificates. T. F. MURPHY, M.D., U. S. Bureau of the Census, Washington, D. C.

Are the Indians Dying Out? FREDERICK L. HOFFMAN, LL.D., Consulting Statistician, Prudential Life Insurance Company, Newark, N. J.

The Variability Exhibited by Different States in the Seasonal Incidence of Typhoid Fever. GAIUS E. HARMON, M.D., Department of Hygiene and Bacteriology, School of Medicine, Western Reserve University, Cleveland, O.

The Rise and Fall of Measles Susceptibles with Epidemic Cycles over a Thirty-Year Period in Baltimore. A. W. HEDRICH, Sc.D., Instructor in Vital Statistics and Epidemiology, Johns Hopkins University, Baltimore, Md. (*Stereopticon Illustration.*)

Fourth Session—Thursday Afternoon

Report of Visits to Local Registrars of Vital Statistics in Maryland. JOHN COLLINSON, M.D., Chief, Bureau of Vital Statistics, State Department of Health, Baltimore, Md.

Tabulation of Causes of Stillbirths, Deaths of Very Young Infants, and Maternal Deaths. HENRY B. HEMENWAY, M.D., State Department of Health, Springfield, Ill.

A Setback in Mid-Life Mortality. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

The Occurrence of Influenza in a Group of Cities since 1918. SELWYN D. COLLINS, Associate Statistician, U. S. Public Health Service, Washington, D. C.

The Organization of Local Health Area Statistics in Two Hundred and Seventy Districts throughout New York City. GODIAS J. DROLET, Statistician, New York Tuberculosis and Health Association, and WILLIAM H. GUILFOY, M.D., Registrar of Records, Department of Health, New York, N. Y.

PUBLIC HEALTH ENGINEERING

First Session—Tuesday Morning

Sanitary Aspects of Collection and Disposal of Refuse (Report of the Committee on Refuse Collection and Disposal). *Chairman,* KENNETH ALLEN, City Sanitary Engineer, New York, N. Y.

The Disposal of Sewage Sludge (Report of the Committee on Sewage Disposal). *Chairman,* C. K. CALVERT, Sanitary Engineer, Indianapolis, Ind.

Sewage Disposal in Minneapolis and St. Paul. J. A. CHILDS, Chief Engineer, Metropolitan Drainage Commission, St. Paul, Minn.

Discussion. C. F. KEYES, Chairman, Metropolitan Drainage Commission, Minneapolis, Minn.

A Model Plumbing Ordinance vs. a Statewide Code. H. F. FERGUSON, Chief Sanitary Engineer, State Department of Health, Springfield, Ill.

Essential Features in the Design of Sanitary Drinking Fountains (Report of the Committee on Plumbing). *Chairman,* C. A. HOLMQUIST, Director, Division of Sanitation, State Department of Health, Albany, N. Y.

Second Session—Wednesday Morning

Bacterial Aftergrowths in Water Distribution Systems (Report of the Committee on Water Supply). *Chairman,* JOHN R. BAYLIS, Chemist, Experimental Filtration Plant, Chicago, Ill.

Water Treatment with Chlorinated Copperas. A. CLINTON DECKER, Sanitary Engineer, Tennessee Coal, Iron and Railroad Company, Birmingham, Ala., and H. G. MENKE, Assistant Sanitary Engineer, State Board of Health, Montgomery, Ala.

New Standards for Public Bathing Beaches and Wading Pools (Report of the Committee on Bathing Places). *Chairman,* STEPHEN DEM. GAGE, Sanitary Engineer, State Board of Health, Providence, R. I.

New Aspects of Shellfish Sanitation (Report of the Committee on Shellfish Supply). *Chairman,* H. D. PEASE, M.D., New York, N. Y.

Section Business and Election of Officers.

Third Session—Wednesday Afternoon

Preparedness for Disasters (Report of the Committee on Disaster Relief). *Chairman,* E. L. FILBY, Chief Engineer, State Board of Health, Jacksonville, Fla.

Lost Ultra-Violet Light Value in Urban Sunshine Due to Air Pollution. FRED O. TONNEY, M.D., and PAUL F. SOMERS, Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

Some Special Problems in Atmospheric Pollution. ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

Appraisal of Public Health Engineering Activities in City Health Work (Report of the Committee on Record Forms). *Chairman,* A. F. ALLEN, Health Officer, Coral Gables, Fla.

Essential Public Health and Economic Values of Mosquito Control (Report of the Committee on Mosquito Control). *Chairman,* LEWIS E. JACKSON, Hudson County Mosquito Extermination Commission, Jersey City, N. J.

INDUSTRIAL HYGIENE

First Session—Thursday Morning

What O'clock Is It in Industrial Hygiene? *Chairman's Address.* FRANK L. RECTOR, M.D., Executive Director, Chicago Medical Association, Chicago, Ill.

Section Business.

The Present Status of the Benzol Hazard in Industry. P. W. GUMAER, PH.D., The Barrett Company, New York, N. Y.

Discussion

Report of the Committee on Volatile Solvents. *Chairman,* ALICE HAMILTON, M.D., Harvard School of Public Health, Boston, Mass.

Discussion

Medical Services on an Ocean Liner. L. J. MILLAN, M.D., Medical Examiner, Bureau of Operations, U. S. Shipping Board, Baltimore, Md.

Discussion

Physical Impairment among Office Workers (A Report on One Thousand Physical Examinations of Sedentary Workers). WILLIAM A. MUHLBERG, M.D., Medical Director, The Union Central Life Insurance Company, and CAREY P. MCCORD, M.D., Medical Director, The Industrial Health Conservancy Laboratories, Cincinnati, O.

No Title. FLOYD P. ALLEN, M.D., Public Health Federation, Cincinnati, O.

Discussion. CHARLES A. NEAL, M.D., State Health Commissioner, Columbus, O., and I. C. RIGGIN, M.D., Director, American Heart Association, New York, N. Y.

Compensation for Occupational Diseases (Report of the Committee on Standard Practices in the Problem of Compensation of Occupational Diseases). *Chairman,* A. J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Discussion

Luncheon Session—Thursday

The Worker and His Health. L. J. ZOELLER, Director of Personnel, Manufacturing Division, The Procter and Gamble Company, Cincinnati, O.

ROUND TABLE DISCUSSION OF THE OBJECTIVES OF INDUSTRIAL HYGIENE, TO INCLUDE:

Report of the Committee on Tuberculosis in Industry. *Chairman,* T. LYLE HAZLETT, M.D., Western Electric and Manufacturing Company, East Pittsburgh, Pa.

and

Report of the Committee on Industrial Morbidity Statistics. *Chairman,* WADE WRIGHT, M.D., Metropolitan Life Insurance Company, New York, N. Y.

Second Session—Friday Morning

Medical Services in Department Stores. W. JACOBSOHN, M.D., Department of Health, New York, N. Y.

Discussion. A. J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Dusty Lung Diseases (Report of the Committee on Silicosis). *Chairman,* R. R. SAYERS, M.D., Chief of Health and Safety Section, U. S. Bureau of Mines, Washington, D. C.

Discussion

Toxicity of High Temperature Coal Tar Distillates (Report of the Committee on High Temperature Coal Tar Distillates). *Chairman,* G. H. GEHRMANN, E. I. DuPont de Nemours Company, Wilmington, Del.

Discussion

The Promotion of Health in the Manufacture of Wheat Products. No Author.

Discussion

New Skin Irritants (Report of the Committee on Skin Irritants). *Chairman,* HENRY F. SMYTH, M.D., Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

Third Session—Friday Afternoon

Section Business and Election of Officers.

Occurrence, Effect and Treatment of Hydrogen Sulphide Poisoning in Industry. W. P. YANT, Supervising Chemist, Health and Laboratory Section, Bureau of Mines, Pittsburgh, Pa.

Discussion

Report of the Committee on Industrial Fatigue. *Chairman,* EUGENE L. FISK, M.D., Medical Director, Life Extension Institute, New York, N. Y.

Discussion

Lead Poisoning in the Brass and Bronze Industries. FRANK D. PEDLEY, M.D., and R. V. WARD, M.D., The Industrial Clinic of Montreal General Hospital, Montreal, Que.

Standard Procedures in Lead Poisoning (Report of the Committee on Lead Poisoning). *Chairman,* EMERY R. HAYHURST, M.D., College of Medicine, Ohio State University, Columbus, O.

Discussion

Anthrax as an Occupational Disease (Report of the Committee on Industrial Anthrax). *Chairman,* HENRY F. SMYTH, M.D., Laboratory of Hygiene, University of Pennsylvania, Philadelphia, Pa.

Discussion

Industrial Hygiene in Soviet Russia. PROFESSOR E. KAGAN, Institute for Pathology and Hygiene of Labor, Charkow, Russia.

Meeting of Section Council.

FOOD, DRUGS AND NUTRITION

First Session—Friday Morning

Report of the Committee on Dairy Products and Eggs. *Chairman,* J. H. SHRADER, PH.D., National Dairy Products Corporation, Baltimore, Md.

The Health of Anabolic Nutrition. FRANCIS L. BURNETT, M.D., Boston, Mass.

The Arsenic Content of Tobacco. E. G. LEMAY, State Department of Health, Austin, Tex.

The Vitamin Content of Ethylene-Treated and Untreated Tomatoes at Various Stages of Development. D. BREESE JONES, PH.D., and E. M. NELSON, PH.D., U. S. Department of Agriculture, Washington, D. C.

The Problem of Sweets for Children (Report of the Committee on Nutritional Problems). *Chairman,* HENRY C. SHERMAN, PH.D., Professor of Chemistry, Columbia University, New York, N. Y.

Luncheon Session—Friday

Election of Officers.

Second Session—Friday Afternoon

Protein in the Diet (Report of the Committee on Meats, Fish and Shellfish). *Chairman,* W. H. LIPMAN, M.D., Swift and Company, Chicago, Ill.

The Vitamin Content of Food in Relation to Health. HAZEL E. MUNSELL, PH.D., Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C.

Bacteriological Control in Commercial Canning. E. J. CAMERON, PH.D., and H. M. LOOMIS, National Canners' Association, Washington, D. C.

No Title. WALTER H. EDDY, PH.D., Professor of Physiological Chemistry, Teachers' College, Columbia University, New York, N. Y.

Report of the Committee on Cereals and Their Products. *Chair-*

man, F. C. BLANCK, PH.D., Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

Report of the Committee on Medicinal Products. *Chairman,* A. J. CRAMP, M.D., Chicago, Ill.

CHILD HYGIENE

First Session—Wednesday Morning

Morbidity and Mortality of Mothers and Newly-Born Infants. JOHN O. POLAK, M.D., Brooklyn, N. Y.

Effect of Antepartum Care of the Mother. BLANCHE M. HAINES, M.D., Children's Bureau, U. S. Department of Labor, Washington, D. C.

Effect of Prenatal Care on the Infant. HENRY F. HELMHOLZ, M.D., Mayo Clinic, Rochester, Minn.

Effect of Intrapartum Care on the Mother. J. P. GREENHILL, M.D., Chicago, Ill.

Effect of Intranatal Care on the Infant. ISAAC A. ABT, M.D., Professor of Pediatrics, Northwestern University Medical School, Chicago, Ill.

Effect of Postnatal Care on the Infant. FREDERIC W. SCHULTZ, M.D., University of Minnesota, Minneapolis, Minn.

Effect of Postpartum Care on the Mother. J. C. LITZENBERG, M.D., Minneapolis, Minn.

The Development of Maternal and Early Infant Care in Its Relation to a Public Health Program. F. J. UNDERWOOD, M.D., State Board of Health, Jackson, Miss.

Discussion. WILLIAM F. KING, M.D., *State Health Commissioner, Indianapolis, Ind.*

Second Session—Wednesday Afternoon

Report of the Committee on the Status of Maternal and Infant Mortality. *Chairman,* JULIUS LEVY, M.D., Director of Child Hygiene, Department of Health, Newark, N. J.

Coöperation of the Rank and File of the Medical Profession in a Study of Maternal and Infant Mortality. C. F. WILINSKY, M.D., Director, Beth Israel Hospital, Boston, Mass.

The Well Baby Clinic and the Office of the Family Physician and Pediatrician. E. J. HUENKENS, M.D., Director of Infant and Preschool Work, Infant Welfare Society, Minneapolis, Minn.

Third Session—Thursday Morning

What Constitutes Mental Health in the Preschool Child? HERBERT E. CHAMBERLAIN, M.D., Director, Child Guidance Clinic, Minneapolis, Minn.

The Relation of Teeth to the Health of the Preschool Child. PERCY R. HOWE, D.D.S., Chief of Research Laboratory, Forsyth Dental Infirmary, Boston, Mass.

The Significance of Proper Posture in the Preschool Child. No Author.

or

The Extent to Which Health Departments Are Justified in Maintaining Free Mental, Dental, Postural and Nutritional Clinics for the Preschool Child. No Author.

PUBLIC HEALTH EDUCATION

First Session—Tuesday Afternoon

ESTABLISHED POINTS IN A COMMUNITY PROGRAM OF HEALTH EDUCATION:

a. The Health Department's Program. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

b. The Voluntary Health Agency's Field. BLEECKER MARQUETTE, Public Health Federation, Cincinnati, O.

c. The School's Health Program. WILLIS A. SUTTON, Superintendent of Schools, Atlanta, Ga.

Dinner Session—Tuesday Evening

Section Business. Closed Session for members and Fellows of Section.

Luncheon Session—Wednesday

Chairman, RAY H. EVERETT, LL.B., American Social Hygiene Association, New York, N. Y.

Health Education Questions and Answers. A. T. MCCORMACK, M.D., State Health Officer, Louisville, Ky.

Second Session—Wednesday Afternoon

Health Education as a Community Asset (*A Summary of the First Session*). IRA V. HISCOCK, Yale University, New Haven, Conn.

Discussion. MARY S. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

Luncheon Session—Thursday

Chairman, PHILIP S. PLATT, New York Tuberculosis and Health Association, New York, N. Y.

Develop Health Education in Your Clinics!

Third Session—Friday Morning

What to Tell (*A Clinic Session on the Scientific Content of Health Educational Pamphlets, Posters, Exhibits, et al.*).

Chief Clinician—IAGO GALDSTON, M.D., Bureau of Health Education, New York Tuberculosis and Health Association, New York, N. Y.

Associate Clinician—EVART G. ROUTZAHN, Russell Sage Foundation, New York, N. Y.

PUBLIC HEALTH NURSING

Luncheon Session—Thursday (*Closed Session*)

Where Should the Nursing Division Stand in State Departments of Health? A. T. McCORMACK, M.D., State Health Officer, Louisville, Ky.

Discussion

Salary Schedules and Their Effect on Quality of Service. GRACE Ross, R.N., Superintendent of Nurses, Department of Health, Detroit, Mich.

First Session—Thursday Afternoon

(Continuation of Luncheon Session)

Civil Service and the Best Possible Medium That Can Be Developed in Standardizing the Appointments of Qualified Public Health Nurses. AMELIA GRANT, R.N., Director, Bureau of Nursing, Department of Health, New York, N. Y.

Discussion

Public Health Nursing Legislation. What It Should Include. MATHILDE S. KUHLMAN, R.N., Director, Division of Public Health Nursing, State Department of Health, Albany, N. Y.

What the Duties of a Communicable Disease Nursing Staff in the Health Department Should Be. AGNES J. MARTIN, R.N., Director, Bureau of Nursing, Department of Health, Syracuse, N. Y.

Discussion

Second Session—Friday Afternoon

What Should Be Included in the First-Aid Cabinet of a School Nurse? and What Should Her Standing Orders Be for First-Aid and Her School Nursing Procedure? CHARLES C. WILSON, M.D., Director of Health, Department of Health Education, Public Schools, Evansville, Ind.

What Is an Adequate Program of Supervision in Rural Communities Where the Problem Is Complicated by the Area to Be Covered —Equipment of the Staff, Nature of the Service, etc.? PEARL McIVER, R.N., Director, Public Health Nursing, Division of Child Hygiene, State Board of Health, Jefferson City, Mo.

Discussion

What, If Any, Is the Difference in the Need for Morbidity Care by a Public Health Nursing Staff in a Rural Community as Compared with an Urban Community? Is Less Service Required? If So, Why? ELIZABETH L. SMELLIE, R.N., Chief Superintendent, Victorian Order of Nurses for Canada, Ottawa, Ont.

Discussion

How Far Can a Public Health Nurse Assume Responsibility for the Social Phase of Her Health Work without Jeopardizing Her Primary Objective? KATHERINE FAVILLE, R.N., Department of Nursing Education, Teachers College, Columbia University, New York, N. Y.

What Preparation Should the Public Health Nurse Have for Rural Work? I. MALINDE HAVEY, Assistant Director, Public Health Nursing Service, American Red Cross, Washington, D. C.

EPIDEMIOLOGY

First Session—Tuesday Afternoon

Section Business and Election of Officers.

The Influenza Epidemic of 1928–1929 in the United States. SELWYN D. COLLINS, PH.D., Statistical Office, U. S. Public Health Service, Washington, D. C.

What We Know of Influenza and How We May Add to Our Knowledge. EDWIN O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Second Session—Thursday Afternoon

Practical Points in Technic of Field Epidemiology. FRANK W. LAIDLAW, M.D., District State Health Officer, Middletown, N. Y.

Relation between Collection and Use of Epidemiological Data. V. L. ELLICOTT, Epidemiologist, Health Department, Baltimore, Md.

Seasonal and Age Studies of Poliomyelitis and What They Suggest. W. LLOYD AYCOCK, M.D., Harvard Medical School, Boston, Mass.

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN CHILD HEALTH ASSOCIATION

This organization will participate in the sessions of the Child Hygiene Section of the American Public Health Association. It will also hold an all-day meeting as follows:

First Session—Friday Morning

PRINCIPLES OF SOCIAL RESEARCH

Scientific Progress in Education. By an Educator.

Biometrics Applied to Public Health. RAYMOND H. FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

Second Session—Friday Afternoon

WEIGHT, GROWTH AND NUTRITION

Chairman, THOMAS D. WOOD, M.D., Columbia University, New York, N. Y.

Introductory Remarks by the Chairman.

Results of the School Health Study. RAYMOND H. FRANZEN, PH.D., Research Director, School Health Study, American Child Health Association, New York, N. Y.

Clinical Diagnosis of Nutrition. LOUIS C. SCHROEDER, M.D., Chief, Pediatric Clinic, New York Nursery and Child's Hospital, New York, N. Y.

Contributions of Anthropometry to an Understanding of Growth and Nutrition. By an Anthropologist.

Discussion

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

First Session—Monday Morning

Address of Welcome. A. J. CHESLEY, M.D., Secretary and Executive Officer, State Department of Health, St. Paul, Minn.

President's Address. JOHN A. CECONI, M.D., Director, Department of School Hygiene, Public Schools, Boston, Mass.

The Importance of Standardizing Light in Testing Vision of School Children. B. FRANKLIN ROYER, M.D., Medical Director, National Society for the Prevention of Blindness, New York, N. Y.

Modern Methods of Testing Hearing with Special Reference to the Audiometer. A. M. KERR, M.D., Medical Supervisor, Public Schools, Pittsburgh, Pa.

Mental Safety for School Children. HERBERT E. CHAMBERLAIN, M.D., Director, Child Guidance Clinic, Minneapolis, Minn.

Physical Safety for School Children. MARION TELFORD, National Safety Council, Chicago, Ill.

Discussion

Question Box

Second Session—Monday Evening

Association Business and Election of Officers.

When Should Tonsils Be Removed? Standard Recommendations for School Physicians. J. L. BOWMAN, M.D., Health Officer, Montgomery, Ala.

The Relation of the Nutritionist to a School Health Program. CLYDE B. SCHUMAN, Director, Nutrition Service, American Red Cross, Washington, D. C.

Discussion

Question Box

Third Session—Tuesday Morning

No Title. HARRY B. BURNS, M.D., Director, Department of Hygiene, Pittsburgh, Pa.

Health Education in the Houston Public Schools. H. K. READ, M.D., Supervisor of Hygiene, Houston, Tex.

New Jersey's Continuous Child Health Program. JULIUS LEVY, M.D., Director of Child Hygiene, Department of Health, Newark, N. J.

The Selection of School Physicians. LYMAN W. CHILDS, M.D., Supervisor of Health Service, Board of Education, Cleveland, O.

Discussion

Question Box

Dinner Session—Tuesday Evening

Presiding Officer, JOHN A. CECONI, M.D., Director, Department of School Hygiene, Public Schools, Boston, Mass.

Presentation of New Officers.

Greetings from the American Public Health Association. J. H. MASON KNOX, JR., M.D., Department of Health, Baltimore, Md.

Presentation of Ling Foundation Medal to William A. Howe, M.D. By SVEN LOKRANTZ, M.D., Medical Director, Los Angeles City Schools, Los Angeles, Calif.

Health Value in Education. JAMES M. MCCONNELL, State Commissioner of Education, St. Paul, Minn.

Health a Prerequisite for Education. MATTHIAS NICOLL, JR., M.D., State Commissioner of Health, Albany, N. Y.

Coöperation by Health Education and Health Service. HUGH S. CUMMING, M.D., Surgeon General, U. S. Public Health Service, Washington, D. C.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

Sunday, September 29—2:30 P.M.

Meeting of the Organization Committee.

Monday, September 30—9:00 A.M.

Meeting of the Organization Committee.

Monday, September 30—2:30 P.M.

Organization Meeting of Members.

a. Adoption of Constitution and By-laws.

b. The Purpose of Our Organization. ARNOLD H. KEGEL, M.D., Commissioner of Health, Chicago, Ill.

c. Election of Officers.

Monday, September 30—4:30 P.M.

Meeting of the Executive Committee.

AMERICAN SOCIAL HYGIENE ASSOCIATION AND MINNESOTA SOCIAL HYGIENE COMMITTEE

Dinner Session—Friday

Chairman, WILLIAM F. SNOW, M.D., General Director, American Social Hygiene Association, New York, N. Y.

Evening Session—Friday

Chairman, MRS. DAVID F. SIMPSON, Minneapolis, Minn.

Social Hygiene and Social Progress. VALERIA H. PARKER, M.D., President, National Council of Women, New York, N. Y.

Social Hygiene and Public Health. C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

CONFERENCE OF STATE LABORATORY DIRECTORS

The Conference of State Laboratory Directors will be held in Minneapolis on Monday, September 30, at 3 P.M., with dinner at 6. As in previous years, the meeting will be very informal, with particular attention paid to those problems which are peculiar to the administration of state laboratories.

NORTHWEST CONFERENCE OF CHILD HEALTH AND PARENT EDUCATION

This conference plans to hold a morning session followed by luncheons on Wednesday, and an evening session on the same day; also a morning session on Thursday.

MINNESOTA STATE SANITARY CONFERENCE

There will be no formal program.

MINNESOTA STATE PUBLIC HEALTH ASSOCIATION

MINNESOTA STATE ORGANIZATION FOR PUBLIC HEALTH NURSING

HOTELS

Make your hotel reservation well in advance. For a list of hotels see the May JOURNAL, page 543.

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HOTEL RESERVATION BLANK

To .....
(Name of Hotel)

Please reserve for me.....rooms for.....persons for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room $.....Minimum rate per day for room $.....

I expect to arrive..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address .....

City ..... State .....

ASSOCIATION NEWS

SEDGWICK MEDAL AWARD

The American Public Health Association announces that the first award of the Sedgwick Memorial Medal will be considered in 1929. This award was established in honor of the late Professor William Thompson Sedgwick, a former President of the American Public Health Association. The fund which provides the medal was raised by popular subscription from Professor Sedgwick's former students and friends. It is to be awarded for distinguished service in public health.

Except for the fact that it is limited to the recognition of service in the field of public health, there is no restriction as to the special line of service that will be considered. Administration, research, education, technical service, and all other specialties in the public health field will receive consideration. No limitations as to age, sex or residence have been fixed, though only those who are nationals of the countries in the American Public Health Association—at present, United States, Canada, Cuba and Mexico—are eligible.

The committee of the Association which has this matter in charge is composed of:

Homer N. Calver
Charles V. Chapin, M.D.
Lee K. Frankel, Ph.D.
Professor E. O. Jordan
George W. McCoy, M.D.
M. P. Ravenel, M.D.
M. J. Rosenau, M.D.
Robert Spurr Weston

The committee will not consider direct applications from candidates, but asks for nominations, giving the information suggested in the accompanying form. Nominations should be addressed to the Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y., and should include the following:

Name of the proposed candidate
Residence address
Business address
Age
Country of which the candidate is a citizen
Degrees held, date received and institutions from which received
Principal public health positions held
A brief description of the service performed because of which the candidate is recommended for consideration. This should include information as to when and where the work was done, the name of the organization or institution, if any, under whose auspices or in whose service the candidate worked, an estimation of the direct or indirect effect of the work measured in terms of life-saving or benefit to humanity. Publications, or similar data, published or unpublished, will be helpful to the committee. To be considered, the service must have been actually performed and not be merely a plan or suggestion.

Anonymous recommendations will not be considered; and the committee reserves the right to refrain from making awards in any year.

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

At the Annual Meeting of the Pennsylvania Public Health Association, held at Altoona, Pa., the following officers were elected: *President,* J. T. Butz, M.D.; *Vice President,* C. B. Maits, M.D.; *Secretary-Treasurer,* W. C. Miller, M.D.; *Assistant Treasurer,* Edgar S. Everhart, M.D. The Executive Committee consists of T. B. Appel, M.D., T. W. Henderson, A. M. Dewels, T. M. McMillan, M.D., Mrs. Lois Owen and H. C. Froutz, M.D.

MISSOURI PUBLIC HEALTH ASSOCIATION

At the Fifth Annual Meeting of the Missouri Public Health Association, held in Jefferson City, May 22–24, 1929,

the following officers were elected for the year 1929: *President,* Dr. L. Mason Lyons; *1st Vice President,* Ora Ann Carl, R.N.; *2d Vice President,* A. J. Drake, M.D.; *Secretary,* R. L. Laybourn; *Treasurer,* J. Frank Field.

NEW MEMBERS

Florence Bahn, Brooklyn, N. Y., Supervisor of Health Education, New York City Schools

Mary B. Baird, M.D., Evanston, Ill., School Physician

Eleanor Barnes, A.B., Worcester, Mass., Financial Agent, The Central New England Sanatorium and Industrial Colony, Rutland, Mass. (Assoc.)

Charles R. Blunt, Trenton, N. J., Commissioner of Labor, Department of Labor

Ethel G. Brooks, R.N., Wheeling, W. Va., Supervisor, Red Cross Public Health Nursing Service

Edwin Cameron, M.D., C.M., Beattyville, Ky., County Health Officer

A. J. Cohen, M.D., Philadelphia, Pa., Chief, Tuberculosis Division of the Department of Health

Calvin L. Cooper, M.D., Kansas City, Mo., Director of Public Health

J. W. Costello, Los Angeles, Calif. (Assoc.)

Joseph P. Kane, M.D., C.P.H., New York, N. Y., Field Director, Chautauqua Health Program

William T. Knoop, M.D., Edgewood, R. I., School Physician, Cranston, R. I.

William B. Kohn, V.M.D., Atlantic City, N. J. (Assoc.)

Edna Lewis, R.N., Tulsa, Okla., Director, Health Education, Jackson County, Mo.

William J. Lewis, Oil City, Pa., Health Officer and Milk Inspector

L. Mason Lyons, M.D., Kansas City, Mo., City Epidemiologist

Max J. Mackler, Ph.C., Ph.D., Tampa, Fla., Assistant City Health Officer

James S. McLester, M.D., Birmingham, Ala., Medical Director in Public Schools

Percy F. Murray, Peabody, Mass., Agent of Board of Health

Lillian I. Nichols, R.N., Saginaw, Mich., in charge of tuberculosis work

Terigi R. Paganelli, M.D., New York, N. Y., Eye Surgeon, Board of Education

George F. Pardee, C.E., Saugatuck, Mich., Sanitary Engineer

Ella M. Reynolds, R.N., St. Joseph, Mo., Buchanan County Health Nurse

William H. Robin, M.D., New Orleans, La., Superintendent of Public Health

Charles M. Sprague, A.B., Stanford University, Calif. (Assoc.)

John A. Stevens, M.D., Aliquippa, Pa., Beaver County Medical Director

Olga O. Teincuff, R.N., University City, Mo., Chief Nurse, St. Louis County Health Department

Robert B. Van Horn, C.E., Seattle, Wash., Assistant Professor of Civil Engineering, University of Washington

John H. Watkins, New Haven, Conn., Assistant Health Officer

DECEASED MEMBERS

R. S. Cooley, M.D., Cleveland, O., Elected Member 1924

M. R. Donovan, M.D., Lynn, Mass., Elected Member 1919

John B. Mitchell, Chevy Chase, Md., Elected Member 1923

Samuel H. Gilliland, M.D., Marietta, Pa., Elected Member 1900, Fellow 1922

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Relationship with Private Physician—The ever present question of the need of closer coöperation between the practitioner of medicine and the organized health agency is strikingly referred to in a letter by Ernst P. Boas, M.D., recently published in the *Bulletin of the Bronx County Medical Society* and reproduced in the *Weekly Bulletin* of the New York City Health Department for April 13, 1929:

> Modern trends in medical practice will continue, for although they may work harm to the physician's pocketbook, by and large they benefit the public. The physician has no proprietary rights in his patients. In his capacity as a private practitioner he has no vested monopoly in all that pertains to the health and well-being of society. Just so long as his attitude is disinterested and guided by the needs of the many rather than of himself alone; just so long as he cultivates the acquisition, increase, and practice of medical knowledge, and regards his financial reward as a by-product rather than an end in itself; he will be honored in the community, and his counsel will be respected and followed. When he becomes primarily a tradesman, he properly loses caste and influence.
>
> It is true that the increasing socialism of medicine has led to and has perpetuated a number of injustices. The physician is still expected to give a large part of his time and services to the public welfare without compensation, or with inadequate compensation. It would, to my mind, be perfectly proper for physicians to demand payment for their work in hospitals and clinics. Such work is an assumption by one class—the physicians—of obligations that properly rest upon the whole community. Propaganda and action to achieve this end may be dignified and legitimate. It will certainly be more fruitful than these blind and furious onslaughts against measures for public health or public relief that are of proven value.
>
> But in every approach to these intricate problems that involve the relationship of the physician to the community, let us remember that we are members of the profession with a noble tradition, and that in dealing with human lives there is no place for the customs and practices of unscrupulous tradesmen.
>
> And it is our county societies, the building stones of our state and national societies, pledged to an honorable code of ethics, who should primarily keep alive the idealism, integrity and selflessness of the profession of medicine.

Does Vaccination Protect Dogs against Rabies?—There has been so much controversy as to whether or not the single injection method of vaccination protects dogs against rabies that it seems wise to publish each bit of information that may help in deciding the question. Detroit has been carrying on the single injection method of vaccinating against rabies since 1924, but 1928 is the only year in which records have been sufficiently accurate to permit of a comprehensive study. The detailed results of this study have been published in the May number of *City Health* (the monthly publication of the Detroit Department of Health).

During 1928 there were 5,799 persons reported bitten by animals in the City of Detroit. It was possible to obtain accurate information by personal investigation on 2,783 dogs which had bitten people. Of this number, 581 dogs were vaccinated and 2,202 were not vaccinated. Among the 581 vaccinated dogs, there were 3 with rabies, which gives a rabies incidence of 0.52 per cent. Among the 2,202 dogs which were not vaccinated, there were 131 rabid dogs, a rabies incidence of 5.94 per cent. According to these figures, which, it must be remembered, are based on the selected

group investigated by this department, the chances of developing rabies from a dog bite are 11.4 times as great if the dog has never been vaccinated as they would be if the dog had been vaccinated.

To test the accuracy of these figures, the problem was approached from a different angle. In 1928 there were 52,263 licensed dogs. Among the dogs of which we have definite knowledge, 41.4 per cent were vaccinated. Applying this percentage to the city as a whole we find that Detroit's dog population in 1928 was 126,239. This is obviously an estimate, and too much reliance cannot be placed in it. It is believed, however, that it is a reasonable approximation. There were, in 1928, 28,000 dogs vaccinated against rabies; the remaining 98,239 were not vaccinated. Among the vaccinated dogs, there were 10 cases of rabies, an incidence of 0.36 cases per 1,000 vaccinated dogs. In the 98,239 unvaccinated dogs, there were 441 cases of rabies, an incidence of 4.49 cases per 1,000 unvaccinated dogs. From these figures, we may conclude that an unvaccinated dog is 12.5 times more likely to contract rabies than a vaccinated animal. This figure is quite comparable with that of 11.4 which prevailed among those dogs for which definite information was obtained.

While the contention that the single injection method does not protect against certain types of street virus is very likely justified, the contention that it is worthless is not true. We must admit that, as is the case with most prophylactic measures, the protection afforded is relative rather than absolute, but the fact that a vaccinated dog is approximately 12 times less likely to contract rabies than a dog which is not vaccinated seems sufficient evidence to commend its use.

If we figure the rabies death rate among dogs as if it were a human rate, we find that it is 358 per 100,000 dogs. For the unvaccinated dogs, the rate is 449, while for the vaccinated dogs it is only 35.7. It is of interest to compare these with the human death rates from certain specific causes for the same year. In 1928 the diphtheria rate per 100,000 population was 16.3; the scarlet fever rate was 4.7; the tuberculosis rate was 94.8; the typhoid fever rate was 1.0; the measles rate was 11.8 and the whooping cough rate was 6.2. The combined death rate of all these causes was 134.8.

To those interested in the conservation of dog life alone, these figures should have a dramatic appeal. The comparison with the rates for human diseases shows in a startling manner the seriousness of the situation from the canine point of view. The death rate from rabies among dogs is nearly 3 times that for all the common communicable diseases for humans put together. The lesson to be learned from a comparison of the vaccinated with the unvaccinated is obvious.—George B. Darling, Jr., Assistant Epidemiologist, Detroit Dept. of Health.

Rural Health Administration in Iowa—Word has been received from Henry Albert, M.D., State Commissioner of Health, to the effect that the Legislature has transferred the State Epidemiological Service from the University of Iowa to the State Department of Health. The tuberculosis appropriation has been transferred from the State Board of Control to the State Department of Health. The Legislature has also made provision in the State Health Department for a law enforcement division, and has added another full-time and 2 part-time engineers for special service in connection with cities, tourists' camps, highway water supplies, etc.

The most outstanding act of the Legislature, however, in the field of public health was the passage of a county health bill which permits county supervisors to organize county health units

under the direction of a board of health, to consist of not more than 11 members, 3 of whom shall be members of the local county medical society, and others, who may include representatives of local boards of health of incorporated cities or towns situated within the county, to be appointed by the county supervisors.

LABORATORY

C. C. YOUNG

SIMPLE TEST FOR DELAYED ALUM FLOC IN FILTERED WATER

FRANK E. HALE, PH. D.

Department of Water Supply, New York, N. Y.

WATERS high in color, particularly when the color lacks age, frequently show incomplete flocculation of alum previous to filtration. Aggravation of this difficulty is caused by lack of sufficiently long storage after addition of the chemicals and also by the cold temperatures of winter. This condition is sometimes indicated by alum floc gathering in the bottom of a bottle of filtered water which has been allowed to stand for 24 hours in the warm laboratory; but even when no floc appears in this case, flocculation is frequently induced by passage through the fine sand (60–120 mesh) used for concentrating a sample for microscopic examination. It then appears as amorphous matter in the Sedgwick-Rafter cell and may be so roughly estimated quantitatively. To facilitate its recognition it is best to leave a fair sized air-bubble and rotate this around the cell several times. This gathers the floc into large masses of rather characteristic appearance. To distinguish the floc further from ordinary amorphous matter just sufficient " Alizarin S " (the reagent is a 0.1 per cent filtered solution of commercial alizarin S, the sodium salt of alizarin monosulphonic acid) is added to give a slight color to the liquid. The air-bubble is then rotated when the floc will gather all the dye and leave the liquid colorless. Ordinary amorphous matter will not take up the dye in this fashion. The method also serves to distinguish delayed alum floc from aluminum in clay which is included in any chemical quantitative method. It would thus be useful in examination of distribution system samples for delayed alum floc.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Maternal Mortality—During the year 1928 there were 5,001 patients in the obstetrical service of the New York Lying-In Hospital. Of these, 3,825 were in the wards, and 1,176 were in the outdoor department. In 1927, there were 4,871 patients, 3,648 of whom were in the wards, and 1,223 in the outdoor department. During 1928 there were 25 deaths, 1 of which occurred in the outdoor service. Eighteen patients were regular applicants who had been under hospital observation, and 7 were emergency cases first seen at the time of their entrance into the hospital. Four of the fatal cases had Caesarean operations performed. There were 3 low forceps cases, all regular applicants. The causes of death among these were: pneumonia, postpartum hemorrhage and peritonitis. There were 2 emergency breech cases and 10 spontaneous deliveries. In 3 of the spontaneous deliveries the cause of death was pneumonia, in 2 peritonitis, and in 2 endocarditis.—Meyer Rosensohn. Maternal Mortality for the Year 1928 at the New York Lying-In Hospital. *M. J. & Record,* 129: 517–518 (May 1), 1929.

The Incidence of Heart Disease in School Children—A survey was made of 10,333 children in 10 public schools of Philadelphia in order to determine the incidence of organic heart disease. The average percentage of heart disease in the children of all ages was 0.91. Of 5,052 children examined in the elementary schools 0.69 per cent had heart disease, as compared with 1.11 per cent of 5,281 examined in the high schools. Of the 76 cases found in the elementary and junior high schools, 0.78 per cent were among boys, as against 1.0 per cent among girls. Thirty-nine of 94 cardiac patients had chronic valvular disease with mitral stenosis, 14 had chronic valvular disease, mitral stenosis and mitral insufficiency, and 21 had hypertrophy of the heart, chronic valvular disease and probably mitral insufficiency. The physiologic diagnosis in 85 of the cases was regular sinus rhythm. Eight cases showed mild or marked sinus arrhythmia. Thirty of the 94 cardiac cases were able to carry on ordinary physical activity without discomfort; 63 cases were unable to carry on ordinary physical activity without discomfort; and 1 case showed aggravation of symptoms even when at rest.

It is suggested that periodic school health examinations would diminish the morbidity of heart disease, by revealing cases for treatment which would otherwise be unrecognized.—Jacob M. Cahan. *J. A. M. A.,* 92: 1576–1579 (May 11), 1929.

The Poliomyelitis Outbreak in Glasgow in 1928—The first recorded outbreak of poliomyelitis in Glasgow occurred in 1928. One hundred and twelve acute cases were reported. The outbreak was confined to the 4 months from July to October, during which period 91 cases occurred. Seventy-three per cent of the 112 cases occurred among children under 5 years. The disease fell most heavily on children between the ages of 1 and 2 years, 28 of the total 112 cases having occurred in this group. Infants under 1 year and children in the age group 4 to 5 were affected to a much lesser extent. The incidence among males was 58 per cent as compared with 42 per cent among females. The dis-

ease apparently showed no predilection for any social class. Fifty-six per cent of the cases showed symptoms of feverishness and malaise. In 6 per cent paralysis was apparently the first indication of illness. In 79 per cent of the cases paralysis appeared within 7 days of onset.

Paralysis was of the spinal type in 86 of the cases, and the lower limbs were principally affected. There were 8 deaths which occurred during the peak of the outbreak. In 4 cases death occurred on the third day from the onset of illness; in 3 cases on the fourth day; and in 1 case on the fifth day. At the end of January, 1929, an inquiry was made into the 86 cases of the spinal type. Four of these cases had moved from the city and 2 had died of intercurrent affections. Of the remaining 80 cases, 10 were still in the hospital, 41 were attending as out-patients, and 29 were home under medical supervision. Thirty of the 80 cases were still wearing splints or plaster, and the remaining were receiving massage, ultra-violet ray treatment, or no treatment. Forty-three per cent of the 80 cases were considered more or less completely recovered.—*Med. Off.*, 41: 155–160 (April 13), 1929.

Capetown Health Report, 1927—There is a population of over 200,000 inhabitants in Capetown, nearly half of whom are non-Europeans. The birth rate for Europeans has declined steadily, and in 1927 it was 21.4 per 1,000 population, the lowest yet recorded. The non-European birth rate was 50.3 per 1,000 population. The European death rate from all causes was 10.7 per 1,000 population, as compared with a rate of 28.0 for non-Europeans. The death rate for 1927 was somewhat higher than for the previous year on account of an increased mortality from respiratory diseases associated with an unusually cold winter.

The death rate from tuberculosis has shown no decrease during the past 10 years, and accounts for approximately 1 death in 7. Poverty and overcrowding are the principal causes contributing to this condition.—*Med. Off.*, 41: 165 (Apr. 20), 1929.

Tuberculosis in School Children—A study of tuberculosis among 25,048 school children was made during the 1926–1927 and 1927–1928 school sessions by the Extension Department of the North Carolina Sanatorium. The children were 15 years of age and under. Of the 25,048 children tested, 22.59 per cent showed a positive tuberculin reaction. There were 22,550 white children in the group, 22.07 per cent of whom gave positive reactions, as against 27.34 per cent of 2,498 colored children. Demonstrable tuberculosis was shown in 1.72 per cent of the total number tested, or 7.62 per cent of the positive reactors.

Among the white children 1.53 per cent of those tested had demonstrable tuberculosis, as against 3.21 per cent among the colored. Of the 431 children showing demonstrable tuberculosis, 388 were classified as tracheobronchial, 23 as pulmonary (parenchymal), 4 as tracheobronchial and parenchymal, 14 as extrapulmonary, and 2 as tracheobronchial and extrapulmonary. Six hundred and seventy-four or 2.69 per cent of the total number tested were classified as suspicious. This group included those who had either strongly suspicious symptoms without discoverable cause, or x-ray findings or both.

Suspicious symptoms with no other discoverable cause, and a positive tuberculin test, especially if it is a well marked reaction, justify a tentative or strongly probable diagnosis of juvenile tuberculosis, even though the x-ray is negative—P. P. McCain. A Report of the Study of 25,048 School Children for Tuberculosis. *South. M. J.*, 22: 310–319 (Apr.), 1929.

Japanese Birth Rate in California Declining—The number of Japanese births in California has declined gradually since 1921. In that year 5,275 Japanese births were recorded in the state, as compared with 2,833 in 1928. In 1919 Japanese births constituted 8.0 per cent of all births that occurred within the state, as compared with 3.4 per cent in 1928. In so far as the actual number of Japanese births is concerned, the total number for 1928 is about the same as it was for 1912. The checking of Japanese migration to this country is undoubtedly a factor in the production of the lower birth rate, and the aging of Japanese women who were of child-bearing ages 10 years ago may constitute another factor in the changed conditions.—*Calif. Dept. of Health. Weekly Bull.*, 8: 51 (May 4), 1929.

Health Conditions in Prussia—The decline in the birth rate has continued in Prussia. In 1927 the birth rate was 19.0 per 1,000 population, as compared with 20.3 in 1926. The birth rates for the first two quarters of 1928 were 19.1 and 18.1. There were 10 infant deaths per 100 living births in 1927. For the first quarter of 1928 the infant mortality rate was 10, and for the second quarter it was 9 per 100 live births. The mortality rate from all causes was 12.6 per 1,000 population in 1927, as compared with 12.3 in 1926. For the first quarter of 1928 the mortality rate was 13.4, and for the second quarter it was 12.0 per 1,000.

There were 2 cases of smallpox with no deaths in 1928, and 3 cases with 2 deaths in 1927. Typhoid fever showed a continued tendency to recede. There were 5,326 cases in 1928, as compared with 5,919 in 1927. Diphtheria caused 30,061 cases and 1,911 deaths in 1928, as compared with 24,384 cases and 1,974 deaths in 1927, and 20,336 cases and 1,543 deaths in 1926. Scarlet fever increased from 37,864 cases and 714 deaths in 1926 to 65,497 cases and 1,030 deaths in 1927, and 85,393 cases and 874 deaths in 1928. There was a tuberculosis death rate of 9.6 per 10,000 population in 1927, as compared with a rate of 10.0 in 1926.—*J. A. M. A.*, 92: 1616–1617 (May 11), 1929.

Malaria in the Panama Canal Zone—The Health Officer of the Panama Canal announces that the malaria admission rate among the force employed there was 14.2 per 1,000 for 1928, as compared with 10.7 in 1927 and 14.1 in 1926. The average rate for the last 3 years was 13 in a force having a mean strength of 13,517. The average admission rate for 1916–1925 inclusive was 19 per 1,000. No deaths from malaria have occurred in the Panama Canal force since 1920, except for 2 in 1924.—Four Years without a Malaria Death. *J. A. M. A.*, 92: 1610 (May 11), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

RESULTS OBTAINED IN PHENOLIC WASTE DISPOSAL UNDER THE OHIO RIVER BASIN INTERSTATE STREAM CONSERVATION AGREEMENT *

WILLIAM L. STEVENSON, FELLOW A. P. H. A.

Chief Engineer, Pennsylvania Department of Health, Harrisburg, Pa.

MR. Waring's paper ably sets forth the problem of phenolic waste water disposal from by-product coke ovens; and the splendid spirit of coöperation between that industry and state health departments, and between the health departments which are parties to the Ohio River Interstate Stream Conservation Agreement.

It is gratifying to the Pennsylvania Department of Health to note that the by-product coke oven installations of Pennsylvania on the Ohio River drainage basin have coöperated 100 per cent.

Mr. Waring, probably through modesty, has not told in detail what the companies operating coke ovens along the Mahoning River in Ohio have done for Pennsylvania at the instance of the Ohio Department of Health.

A few years ago Pennsylvania water works using the Beaver River as a source of supply were grievously afflicted with offensive tastes and odors apparently having their origin from the waters of the Mahoning River, which flows through the Youngstown district in Ohio. Today, it is only occasionally that these water works have any trouble, and credit is due to the Ohio companies and the Ohio Department of Health.

Exactly the same thing is true on the Monongahela River, which is used as a source of public water supply at many points in Pennsylvania. Here the abatement of the trouble is due to the coöperation of the company operating the by-product coke oven plant on the Monongahela drainage basin in West Virginia with the State Department of Health.

We feel in Pennsylvania that companies operating by-product coke ovens have done splendid work in expending large sums of money for construction and maintenance of works for the elimination or substantial treatment of their phenolic waste waters, and the problem, therefore, has become one of efficient operation of these works and notice of accidental spills.

Under date of July 9, 1928, all companies operating by-product coke ovens in Pennsylvania, except one, executed a formal agreement with the Sanitary Water Board for the purpose of coöperating for the protection of the public health through the safeguarding of public water supplies.

This agreement obligates the companies:

(a) To maintain, in an adequate state of efficiency, equipment and apparatus for elimination or treatment of waste water actually or potentially offensive in so far as any public water supply affected thereby is concerned.

(b) To sample and test the effluents from the various plant equipment and apparatus at sufficiently frequent intervals to detect the

* Discussion of paper by F. Holman Waring. See page 758 of this issue.

presence of such offensive materials that may occur through accident, corrosion of apparatus or other causes.

(c) To notify the Sanitary Water Board promptly of any accident to the plant equipment and apparatus which might impair the efficient elimination or treatment of the said waste waters.

(d) When accidents occur, to make expeditious repair of such plant equipment and apparatus, and, meanwhile, promptly adopt emergency remedial measures.

(e) To keep the Sanitary Water Board informed of new or improved methods that may be developed for the elimination or treatment of the said waste waters and to give the Sanitary Water Board. full opportunity for determining to its satisfaction the efficacy of such methods.

The agreement obligates the Sanitary Water Board:

(a) Not to make public (excepting as provided in section (b) of this article) information received from the companies parties hereto, pursuant to Section 2(c) hereof, or to use or voluntarily furnish the same for purpose of prosecution, provided that immediate action be taken to make necessary repairs and the other provisions of this agreement be fulfilled.

(b) To give notice to water works in Pennsylvania likely to be affected by effluent from the plant where the said accident occurred in order that the operation of such water works may be modified, if practicable, in order to prevent or minimize offensive tastes or odors in the water supply as delivered to the consumers; and also to give notice to the health departments of down stream states in order that they may likewise give notice to their water works, provided, however, that in any notice given under this sub-section the name of the company at whose plant the accident occurred shall not be made public.

The agreement also provides that:

The bona fide installation and the efficient operation of means for the elimination or treatment of the said waste waters by parties of the second part in accordance with plans submitted to and approved by the Sanitary Water Board shall be deemed as compliance with the requirements of the law.

The Health Departments of Ohio, West Virginia, and Kentucky have formally agreed not to make public the name of the company in Pennsylvania where the accidental spill occurs when notice thereof is received from the Pennsylvania Department of Health, but to notify the water works which might be affected thereby of the possibility that their raw water may have offensive tastes and odors beginning on or about a certain date.

Under this Pennsylvania agreement, arrangements have been consummated with each company in Pennsylvania that it will immediately notify the appropriate district engineer of any accidental spills with necessary data concerning corrective measures taken; and a technic has been erected whereby, upon receipt of such notice, the district engineer will immediately notify all water works in Pennsylvania which might be affected thereby, and also, if it be on the Ohio River Basin, the chief engineers of the Health Departments of Ohio, West Virginia and Kentucky.

Pennsylvania was entirely satisfied with conditions in Pennsylvania on the Ohio River Basin at the important conference held in Pittsburgh in 1924, referred to in Mr. Waring's paper, but now that the Pennsylvania Companies have executed this agreement and set up the arrangement whereby water works may be warned in case of accidents, which obviously cannot be entirely prevented, we feel that the problem of protecting water supplies from wastes from by-product coke ovens in Pennsylvania is completely solved through the splendid spirit of coöperation of these companies.

Echoing Mr. Waring's closing remarks, we feel in Pennsylvania that this demonstrates the entire lack of need of federal legislation bearing upon wastes from by-product coke ovens, because of the interstate nature of the streams involved, and further that the solving of problems of this nature over the conference table rather than in the legislative halls and courts is the practical and successful method.

C. A. HOLMQUIST, FELLOW A. P. H. A.
Director, Division of Sanitation, New York State Department of Health, Albany, N. Y.

THIS very complete paper by Mr. Waring summarizes in an admirable manner the complex problems which have arisen in recent years, due to the growth of the by-product coke oven industry and the universal chlorination of public water supplies, with special reference to the conditions in the Ohio River Basin. The results achieved through conferences between state and industrial authorities indicate what may be accomplished in prevention of the pollution of streams and the improvement in the quality of public water supplies through coöperation, rather than through the arbitrary enforcement of drastic legislation.

Results similar to those in the Ohio River Basin have been obtained in New York State through coöperation with industry where 5 out of 7 by-product coke plants, whose wastes have directly or indirectly affected public water supplies, have completed works for the elimination or recovery of phenol. In only one case has it been necessary to notify the coke plant to care for its wastes and this plant is now carrying on studies to determine the most economical method of treating the wastes compatible with local conditions.

The pollution of public water supplies by phenolic wastes was first brought to the attention of the State Department of Health in 1921, when a village in the central part of the state complained of very objectionable tastes and odors in its public water supply derived from a surface stream and filtered and chlorinated before being delivered to the consumers. About the same time it was learned that the entire season's pack of a pea cannery, which used this public water supply in the process of canning, had been spoiled due to objectionable tastes and odors in the peas.

Investigations of the complaint indicated that the trouble was due to the discharge of wastes from a by-product coke plant which had just been put in operation a few miles above the public water supply intake. Various methods of eliminating the wastes were tried by the coke company with indifferent success, until finally a well 297 feet deep was drilled in limestone formation, into which the ammonia still liquor, amounting to about 90,000 gallons per day, was discharged after passing it through a sedimentation tank and coke strainer to remove lime and other suspended solids in the wastes. This well has operated now for over four years without a material reduction in its capacity, and, so far as is known, this practice has not resulted in the pollution of any ground or surface water supplies, nor have any chloro-phenol tastes occurred in the public water supply below the plant.

At another by-product coke plant in New York State, the ammonia still wastes are coagulated with copperas; settled in a pressure sedimentation tank; filtered through pressure, rapid sand filters; and then discharged into two wells drilled to a depth of about 250 feet. These wells penetrate fresh water bearing stratums which were sealed off, and then penetrate a salt water bearing stratum into which the filtered wastes were discharged. The effective preliminary treatment provided was considered necessary to prevent the clogging of the water bearing stratum.

Two by-product coke plants referred to in Mr. Waring's paper, located at Buffalo and Troy, N. Y., recover phenol from ammonia liquors by means of benzol scrubbers, and discharge the effluent into surface water streams under permits issued by the State Commissioner of Health. One plant recovers from 80 to

90 per cent and the other about 95 per cent of the phenol in the ammonia liquors. In the former case the dilution available is over 200 times as great as in the latter. These plants have been effective in removing deleterious amounts of phenol in the raw water supplies, although even now in the winter months chloro-phenol tastes are occasionally produced in one of the water supplies below the plant. This is due presumably to the fact that the body of water receiving the residual phenolic wastes is cold during the winter so that the biochemical action which leads to modification of the phenols is greatly retarded.

One by-product coke plant in this state discharges the ammonia still liquors into a municipal sewer system and sewage disposal plant consisting of Imhoff tanks. This method of disposal, which, of course, is a very economical one for the gas works, was permitted by the city only after extensive studies and experiments had shown that the discharge of ammonia still liquor into the Imhoff tanks in the proportion of 20,000 gallons of wastes to 20,000,000 gallons of sewage had no deleterious effect on the sludge or on the operation of the Imhoff tanks.

Although these tests and experiments failed to indicate that the contact of the wastes with the sewage produced any appreciable reduction in the phenol content of the wastes, the outlet of the disposal works is more distant from the water supply intake and the dilution greater than the original point of discharge of the wastes, so that the local water supply problem has been solved. While these studies were being made, the water company whose filtered and chlorinated water supply was affected instituted the permanganate treatment of the water, similar to that originated by Sir Alexander Houston of London, England. This treatment proved to be very successful in eliminating chlorophenol tastes in the water. Similar treatment has been inaugurated at another water supply derived from waters occasionally affected by by-product coke wastes.

We have received splendid coöperation from the coke plants in this state and it is hoped that this spirit of cooperation now prevailing throughout the country will be continued in the study of this complex problem, in order that more may be learned as to the best method of disposing of phenolic wastes, and eliminating this serious source of pollution to our public water supplies.

ELLIS S. TISDALE

Chief Engineer, West Virginia State Department of Health, Charleston, W. Va.

MR. Waring has made a clear, concise and complete statement which sets forth the origin of the phenol wastes and chloro-phenol taste menace to public water supplies in the Ohio River Basin, its intensification with the growth and development of the by-product coke industry, and its successful checking by the application of a new and unique principle—the working together of states carrying out a joint policy in cooperation with industry.

One of the clearest pictures of the way in which this movement has grown can be obtained by a brief consideration of the events happening at the by-product coke plant of the Domestic Coke Corporation at Fairmont, W. Va. Here in 1925, after the Interstate Stream Conservation Agreement had been entered into between the states of Ohio, Pennsylvania, and Vest Virginia and joint similar policies set up in each state, this company made an attempt to quench,

but owing to the fact that all the coke went into the domestic market the quench method had to be abandoned due to staining and odor bearing qualities of coke so treated.

Research was immediately stimulated, for the phenol had to be removed if the company was to comply with the joint state policy. Mr. Gericke had his assistant chemists, Sweeney and Jones, make careful studies of the plants at Troy, N. Y., and Lorain, O., and set about building a similar plant, operating on the benzol absorption principle; but with refinements which would raise the plant efficiency on phenol recovery. This they were successful in doing by providing for greatly increased contact by means of beds of coke between the carrier—benzol—and the counterflowing NH_3 liquor which contained the phenol.

The phenol recovery plant at Fairmont which started operation January 1, 1928, built at a cost of $25,000 per 1,000 tons of coke, the daily plant capacity, has been operating throughout these ten months at 96–98 per cent efficiency of phenol recovery and is highly satisfactory to the company in its performance.

When Sanitary Engineers Gorman, of Chicago, and Waring and Hatch, of Ohio, visited this plant in January, 1928, following the bad taste epidemic in the Chicago water supply, it was the most complete and successful phenol treatment recovery plant in operation, and it established a principle, profitable recovery, which has led to rapid changes in existing by-product plants and bids fair to revolutionize the old wasteful quench method of phenol wastes disposal.

The fact that three states in 1924 set up and agreed to a fundamental policy for phenol wastes disposal, which they proposed to carry out by coöperation with industry, stimulated research to a remarkable degree. Not only did the Fairmont plant build a successful phenol recovery plant, but the recovery promised to meet operating charges and possibly fixed charges with a possibility of profit, when refinements were made. Also, the Koppers Company speeded up its experimental work along another line which has resulted in the new and successfully operating recovery plant at Hamilton, O., spoken of by Mr. Waring. This plant recovers more than 98 per cent of the phenol, according to the latest advices, and is simple, positive, and easy of operation. The two new phenol recovery plants at Ironton, O., and Ashland, Ky., which are to be operated on the "light-oil" absorption process, indicate the rapidity with which the program of phenol recovery has gone forward. The Ironton plant was started June 1, 1928.

West Virginia has recently, through joint conferences with the Ohio State Health Department and representatives of industry, provided for the completion of the program of phenol removal from the Ohio River from West Virginia coke plants where final action had not been taken, so that the summer of 1929 should see all phenol wastes out of the Ohio.

In connection with the question of tastes, it is of considerable interest to note that the 98 per cent of removal at Fairmont has eliminated tastes from the Morgantown water supply, and the public water supplies in Pennsylvania on this stream are no longer detrimentally affected by wastes from the Fairmont plant in West Virginia. Likewise the improvement in phenol wastes treatment at Midland, Pa., on the Ohio River above the West Virginia line, has markedly reduced the tastes in the Wheeling water supply. In 1927 bad tastes were recorded on 8 days by G. E. Richard, superintendent of this new filtration plant, and in 1928 only once were phenol tastes recorded. The 100 per cent success already achieved in Ohio in removing phenol wastes has likewise

been a big factor in the decrease in tastes at Wheeling and in other West Virginia Ohio River supplies this year. With the completion of two new phenol recovery plants on the watershed in West Virginia above Wheeling, chlorophenol tastes should become a matter of history.

Certain very definite advances in the public water supply field have been made since the Interstate Stream Conservation Agreement was adopted by Ohio, Pennsylvania and West Virginia in 1924:

1. By its complete success it has been demonstrated that a coöperative policy between states and with industry will work.

2. Carrying this program on the Ohio River Basin to a successful conclusion has been hastened greatly by the recent invention and improvements in phenol recovery processes, which work was stimulated by the coöperative state program.

3. It appears likely that practically all new by-product plants will install phenol recovery processes when the by-product plant is built, since at the present stage of development phenol recovery is on almost a self supporting basis and by-product plants now using the quench method will gradually revamp their works to recover phenol and save the very high depreciation losses involved in the quench method.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Heart Disease and Industry—Heart disease more than any other malady seriously affects the life of the industrial worker. Symptoms of organic heart disease are first complained of after exercise—breathlessness, particularly in the region of the heart, giddiness, fainting, exhaustion and palpitation. Those in heavy work complain first. Not more than half of the workers who break down before the age of 40 with heart symptoms, however, have organic heart disease.

Rheumatic infection is the chief cause of organic trouble, but general ill health likewise accounts for many cases of heart symptoms. Only a small portion with rheumatic heart disease live past the age of 40. After 40, syphilis leads to premature death from heart disease in a small number. Five-sixths of the total number of deaths from heart disease occur after age 40, and the principal cause is a degenerative process of senescent type. Hence, the importance of recognizing this condition early. A suitable occupation, healthy home conditions, and proper medical supervision can prolong the working life of these individuals.

A sanatorium form of treatment should lead to a considerable lowering of heart disease deaths, particularly those of the rheumatic type. Two special convalescent homes for boys and girls with heart disease have been established in London. The economic waste and financial strain on the insurance funds for this disease should cause the public to realize the benefits of convalescent homes, whose cost is comparatively infinitesimal.—Thomas J. Cotton, *J. State Med.*, 37, 2: 100–106 (Feb.), 1929.

The Effects of Labor Legislation on the Employment Opportunities of Women—(Abstract of Summary). With each decade women employees have increased among the gainfully employed. More significant is the great development in the kinds of work open

to them. They have likewise assumed a steadily increasing importance of positions. At the same time, labor legislation applying to women has shown extensive increases, although this is very uneven in the various states, so that not over one-third enjoy legislation limiting hours of work. Massachusetts and California in particular have set up laws governing minimum standards for women's employment. These laws are of two types—those that regulate, and those that prohibit. In the matter of regulations, many qualifications and exemptions are permitted; likewise, legislation is only effective where it is enforced. Hence, conclusions as to the effects of legislation must be drawn with great caution.—Women's Bureau, U. S. Dept. Labor, *Bull. No. 68*, 1928, 22 pp.

The Health of Women and Girls in Relation to Industry—Our intelligent girls from the industrial classes when they leave school usually become highly skilled workers, and when they marry they are far better off because they may continue at such work when, owing to industrial depressions, the husband is out of work. True, there is very little leisure in their lives. Their physical fitness should be vouched for after medical examination. Among practical tests, acuity of vision is specially important, since one encounters women who have passed through all of the standards of the elementary school, but who from disuse have lost the power to read.

Likewise, mental defects, middle ear disease, dysmenorrhea, and defects following childbirth are prominent and lamentable, the more so because so many may be corrected. The mother of a family who has not been damaged in childbirth is perfectly fit for hard physical work. During the War, the author recalls three cases of direct inguinal hernia, as the result of work on lathes; no woman developed an indirect inguinal or femoral hernia; no woman with an intact pelvic floor developed any uterine displacement; and no woman developed cardiac incompetency where the heart was sound on engagement. Work in no way conduced to sterility, but even appeared to render some more fertile. The rate of purposeful abortions was proportional to the rate pregnant women were discharged. When the women were permitted to continue work which was suitable to them, no abortions followed, and they came to term with excellent results, both to themselves and to their children.

The author's practice has failed to find defects in women attributable to hard work, during the war or afterward. The principal point is, physical fitness of women for work, and not that women should not work. "There is no inherent incapacity for hard work in women as a sex, and public opinion and legislation" should be changed in this respect.—Mrs. R. H. B. Adamson, *J. State Med.*, 37, 2: 107–113 (Feb.), 1929.

Women Workers in Flint, Mich.—This bulletin summarizes various conditions of the employment of women, including hours, earnings, working conditions and personal history. The median of the week's earnings was $16.50, and of the year (for 132 women) $775. The usual work day was 8½ to 9 hours, with a short day on Saturday, except in stores. More attention was given to lighting than to ventilation; and particularly, the effect of too much heat and steam did not receive sufficient attention. Inadequate seating was often present. It was found that 31 of the 34 establishments had insanitary drinking "bubblers," and 21 plants were using the common drinking cup. The common towel was found in 56 establishments, and no towels in 24. Toilet facilities were sometimes inadequate. (The bulletin should be consulted by

those interested further.)—Women's Bureau, U. S. Dept. Labor, *Bull. No. 67*, 1929, 79 pp.

Child Labor—This bulletin contains a series of six articles prepared respectively by William John Cooper, U. S. Commissioner of Education; Hugh Grant Rowell, M.D., Teachers College, Columbia University; Olive A. Cooper, M.D., Massachusetts State Department of Mental Hygiene; Weaver Pangburn, Playground and Recreation Association of America; Sidonie M. Gruenberg, Director of the Child Study Association of America; and William Green, President, American Federation of Labor. (Space does not permit more than this mention.)—National Child Labor Committee, 215 Fourth Avenue, New York, N. Y., *Pub. No. 352*, May, 1929, 39 pp.

Trends in Personnel Health Service—This bulletin discusses in Part I the agencies interested in the promotion of organized health and sanitation activities, both prior to and since 1910. Part II takes up industrial groups, including the activities of various industrial associations, many leading companies and corporations of the United States, as well as the efforts of organized labor and joint boards of sanitary control. Among associations, societies and institutions, the names and dates of organization are given for 24. Under "public agencies" are listed the principal medical schools, federal and state departments, bureaus and agencies. Legislation has been concerned principally with reporting, prohibition, regulation and compensation or insurance.

The article ends with a brief summary of the principal literature, and the statement that prior to 1880 the *Index Catalogue* of the Surgeon General's Library shows there were but 5 books, and 75 articles relating to industrial hygiene or occupational diseases by American authors. During the period 1880–1900, American authors made but 22 contributions. From 1900, and more especially from 1908, such contributions increased to the extent that by June 30, 1921, 702 subjects had been indexed in the Library of the Surgeon General's Office.—W. H. Lange, American Management Association, 20 Vesey Street, New York, N. Y., *General Management Series: No. 85*, 1929, 48 pp.

Reporting of Occupational and Industrial Diseases—The first essential in preventive medicine is to know where, and in what numbers, diseases occur; hence, an active law requiring that all physicians report certain well-known and definite diseases to one central department of government having jurisdiction in matters of public health. The next feature is the matter of what to do about such afflictions as occupational diseases and accidents. The problem is how to apply preventive medicine to this situation. However, the result of the lack of coöperation of the physicians has not brought about the ends desired. In the past 4 years, less than 10 physicians, and not more than 5 hospitals (in New York State) have reported occupational diseases. Industrial hygiene is one of the most important subjects of public health, as it deals with nearly one-half of the adult population.

Greatly increased coöperation on the part of the medical profession is necessary, and among the first essentials is the reporting of occupational diseases.—Robert S. McBirney, New York State Bureau of Industrial Hygiene, *Indust. Hyg. Bull.*, 5, 11: 40–44 (May), 1929.

Inadequacy of Present Provisions for Rock Dusting in Coal Mines—The U. S. Bureau of Mines reports in a recent circular (No. 6087) the results of a recent survey on rock dusting in coal mines. This survey disclosed the fact that rock dusting provisions are

woefully inadequate in the United States, and that but a small fraction of 1 per cent of coal mines is adequately protected by rock dust. During the fiscal year ending June 30, 1928, 22 explosions in bituminous mines were reported to the U. S. Bureau of Mines, with 320 fatalities. Of this number, 10 mines with 258 deaths were supposed to have been using rock dust. Investigation, however, revealed the fact that the measures were inadequately enforced because of a lack of proper comprehension of their value. The cost of rock dusting is approximately 1 cent per ton of coal so that the element of cost should not be a bar to its very widespread adoption. It is hoped that rock dusting of mines will increase rapidly in the near future.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 240 (Feb.), 1929.

L. G.

Physiological Response Attending Exposure to Vapors of Methyl Bromide, Methyl Chloride, Ethyl Bromide and Ethyl Chloride—The authors discuss the apparatus and test procedures and results of investigations upon the substances named in the title, some of which are used in refrigeration. A table on page 31 summarizes the physiological response to various concentrations of some 17 common gases and vapors.—R. R. Sayers, W. P. Yant, B. G. H. Thomas and L. B. Berger, *Pub. Health Bull. 185,* 1929, 56 pp.

Quarry Accidents in the United States in 1926—According to the recently published report of the U. S. Bureau of Mines, there was an increase from 1.78 in 1925 to 1.87 in 1926 in the fatality rate per 1,000 300-day workers, and a decrease from 169.67 to 160.28 in the injury rate. Measured by the fatality rate, the accident hazard appears to be greatest in granite quarrying (3.52); next in marble quarrying (3.12). The injury rate was highest in trap rock, being 244.92; limestone being next with a rate of 207.39. The cause of fatal accidents in order of importance was as follows: falls or slides of rock or overburden, explosions, haulage, machinery, electricity, falls of persons and burns. Most of the non-fatal injuries were caused by flying objects, handling rock, machinery, haulage, falling objects, falls of persons, hand tools and falls or slides of rock or overburden.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 239 (Feb.), 1929. L. G.

Occupational Dermatitis—The Bureau of Women in Industry of the New York State Department of Labor has recently completed a study of 390 cases of dermatitis of industrial origin. It was found that 24 per cent were of over 1 year's duration, 21 per cent lasted from 1 to 3 months, and 16 per cent from 4 to 6 months. Ninety-one of the cases began on the hands and spread to other portions of the body. Thirty cases were primary and in other locations, chiefly the legs. Dermatitis on the face appeared to be chiefly a result of carrying irritating substances to the face by the hands of the worker. The largest percentage of cases was caused by soap and soap cleansers. The next largest group was due to dyes and lime. Other causes were lead, ink, flour, sugar, chromic acid, methylene alcohol, etc. One hundred and eighteen cases were associated with house work; included among these were porters, janitors, restaurant workers and building cleaners. The constant handling of carbon paper was a source of dermatitis among stenographers.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 4: 782 (Apr.), 1929. L. G.

Industrial Accidents in Massachusetts, 1926–1927—The Department of Industrial Accidents of the State of Massachusetts has recently issued the report of the industrial statistics for the 15th year (ending June 30, 1927). The

report indicates a decided increase in the number of accidents over the previous year, and also an increase in the number of tabulatable injuries, the latter being increased from 36.7 to 38.3. The most frequent cause of death was associated with vehicles, the next in order being falls of persons. The most frequent cause of permanent disability was machinery, the second most important cause being handling objects. The most frequent cause of temporary disability was handling objects, falls being the second most important cause.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 2: 242 (Feb.), 1929. L. G.

Spray Painting Practices and Hazards—This is a report of an investigation of spray painting methods and hazards in 71 manufacturing and mercantile establishments and 8 government posts, to determine (1) what has been done to overcome the hazards of the process, and (2) what can be done further to protect the worker or eliminate the inherent dangers of the method.

Experience with the use of the spray apparatus in the various plants ranged from 2 months to 20 years. Investigations showed that 36 plants had 1 case each of poisoning; 6 establishments had 2 cases, 2 establishments 3 cases, 2 establishments 5 cases, and 1 plant 6 cases of illness. Twenty-four plants reported no trouble of any kind. Six of the cases resulted in death, while in the remaining a disability up to 1 year's duration was the chief outcome. Most of the cases reported were lead poisoning. There were several cases of lacquer poisoning, 2 cases of benzol poisoning, and 1 case of turpentine poisoning.

Among substitutes for toxic materials titanium oxide is especially recommended in place of lead, and iron oxide in some instances. Experiments conducted by the U. S. Navy indicate that lead can be eliminated entirely by such substitutes which are found to be equal to lead in all qualities studied. Toluol, xylol and similar materials may be substituted for benzol.

It was found that family physicians were treating these cases for ailments based on the outstanding symptoms under such diagnoses as: stomach trouble, appendicitis, etc. Small plants were, as a rule, the more dangerous places. In a few large plants employing as many as 200 to 300 spray operators there have been only one or two slight cases of disability in the course of several years' experience.

In addition to adequate ventilation provisions, additional protection, it is pointed out, may be secured by the enforcement of high standards of personal hygiene, instruction in the proper use of the spray gun, the use of wet sand papering methods in place of dry methods, the use of as low pressure spraying as is consistent with satisfactory output, and the use of non-toxic materials in so far as possible.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 5: 915 (May), 1929. L. G. & E. R. H.

Electrical Accident Prevention—This circular discusses the prevention of electrical shock, the safeguarding of machinery and apparatus, both upon the surface and underground; the prevention of gas ignition and explosions; the suggestions for improvement; and mine-fire prevention.—L. C. Ilsley, U. S. Bu. Mines, *Circular No. 6100*, Feb., 1928, 8 pp.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Experimental Hypervitaminosis—In order to determine the effects of massive doses of vitamin D, 24 white rats, 3 weeks old, weighing 50 to 60 gm., were placed in 3 different cages and kept in the dark on a rachitic diet No. 3143 of McCollum and coworkers. In the first group, 8 control rats were placed on the vitamin diet; in the second group, 8 were on the same diet with the additional dose of 5 mg. of irradiated ergosterol (Vigantol) a day in ½ c.c. of 1 per cent solution of olive oil, and in the third group, 8 animals on the same diet with the addition of a dose of 3 drops of cod liver oil per day. Between 3 and 5 weeks all of the animals receiving the excessive dose of ergosterol died, this dose being about one thousand times higher than that used by Gyorgi and other investigators. Those in groups 1 and 3 at the end of the 5th week showed no deleterious effects. They kept their appetite and developed well.

A second experiment of overdosage gave the same results. Four rats receiving the excessive doses were taken from the cages and the dosage stopped. After that the result on health, appetite, development, and increase in weight was favorable, similar to the control rats. The remainder of the rats receiving the excessive ergosterol gave the same severe pathological changes, and death occurred within the 4th and 5th weeks.

The authors describe the symptoms of hypervitaminosis which they term "Vitaminismus." These are chiefly: general loss of weight of 30 per cent despite a relatively good appetite, arrested development, increased temperature, rough coats, and, in some cases, paralysis of the legs. The authors discuss 3 manifestations of so-called "Vitaminopathy": (1) through deficiency or hypovitaminosis; (2) through excess or hypervitaminosis; and (3) through lack of coördination between the different vitamins or dysvitaminosis. The importance of this knowledge is stressed in the application of vitamin supplements in the treatment of children's diseases and it is concluded that the results are as remarkable as the original discovery of vitamins. The dose of vitamin D administered was 5,000 to 50,000 greater than that ordinarily employed so that the difference between the necessary and the fatal dose is great and difficult to estimate in the case of man. —J. A. Collazo, P. Rubino, and B. Varela, *Biochem. Ztschr.*, 204: 347 (Jan.), 1929.

"Hypervitaminosis" and "Vitamin Balance"—Previous investigators have reported injurious effects of excessive doses of vitamin D, most of the work published relating to cod liver oil or its concentrates as the source of this vitamin, although in some of the recent work irradiated ergosterol was used. The present work was done on growing rats and the vitamin preparations were administered with the ration instead of separately. In one experiment young rats weighing 40 to 50 gm. each were given synthetic diets containing irradiated ergosterol in the concentrations 0.00001, 0.001, and 0.1 per cent, the controls being given the same dose of non-irradiated ergosterol and heated ergosterol, and some no ergosterol. In addition, each animal received 2 drops daily of cod liver oil and an alcoholic extract of marmite. All animals re-

ceiving 0.1 per cent of irradiated ergosterol lost weight and died after 20 days; those with smaller concentrations grew normally and appeared to thrive. No ill effects were observed on the controls receiving heated or non-irradiated ergosterol. The rats on the high concentrations suffered inanition, diarrhea, and developed lesions on the hind paws, as well as greasy and rough coats. Post-mortem appearance resembled vitamin B deprivation.

An experiment was conducted to see if the deleterious effects of the ergosterol could be offset by an increase of vitamin B (Complex). The marmite dose was increased to 4 times the normal level but with negative results. Two animals given fourfold marmite with added wheat germ extract and orange juice maintained weight and apparent good health while the controls with unsupplemented diets declined. Rats refused to eat synthetic diets containing 250 mg. of irradiated ergosterol while they readily ate those of the same amount of non-irradiated ergosterol.

In another experiment rats were offered synthetic diets containing (1) non-irradiated ergosterol, (2) irradiated ergosterol, and (3) no ergosterol. Non-irradiated ergosterol was eaten in preference to the irradiated. In animals deprived of vitamin B, growth stopped and death took place at about the same rate irrespective of the amount of vitamin D in the diet. Rats receiving a thousand times the necessary vitamin D succumbed to B-avitaminosis at the same rate as those receiving no vitamin D in the diet. Similar diets were fed two sets of rats with the exception that one received 15 per cent of the fat in potent cod liver oil and the other the same fat content in peanut oil. These sets were then placed on different allowances of standard marmite to note the effect of vitamin B intake. The cod liver oil rats grew slower than the ones on peanut oil. Differences were most marked in the intermediate marmite concentrations adequate for maintenance. Only small differences were observed at the highest and lowest marmite levels. In this experiment no litters were obtained from the cod liver oil group, but on the peanut oil group 7 litters were obtained, all from the rats receiving a maximum marmite extract in the diet.

Cod liver oil concentrate (unsaponified matter of cod liver oil) was administered to one of two groups of rats on standard diet without marmite addition. Both groups showed vitamin B deprivation, but the loss in weight was more rapid in the group receiving the concentrate. The condition in this group ultimately resembled pellagra.

The authors conclude that while the results indicate toxic properties attributed to vitamin D the question is complicated by the fact that vitamin D cannot be administered at the present time free from impurities and that the toxic substance might be attributed to accompanying impurities, and the further possibility that the excess vitamin D unbalances the vitamin B allowance.

Further experiments are in progress to determine the effects of ergosterol which has lost its vitamin D through over-irradiation and the effect of vitamin D upon calcium and phosphorus metabolism.

The authors caution against alarm in the use of commercial preparations since the doses shown to produce toxic effects were greatly in excess of those which would ordinarily be employed in practice.—Leslie Julius Harris and Thomas Moore, *Biochem. J.*, 22: 1461, 1928.

The Commercial Application of Lactobacillus Acidophilus Milk—This is a brief review of the literature on the therapeutic value of *L. acidophilus* in milk culture; the report of studies on the isolation of the organism from the feces of rats on high lactose diets, the

change in the intestinal flora of rats following feeding with *L. acidophilus* cultures, and the growth and viability of the organism under varying conditions; and a description of the commercial method of manufacturing acidophilus milk with general directions for its use. An extensive list of literature references is appended.—E. L. Reichart and H. P. Davis, *Nebraska Sta. Bul. 228,* 1928, p. 19. Abstract, *Exper. Sta. Rec.,* 60: 593 (Apr.), 1929.

Antineuritic and Water-soluble B Vitamins in Beef and Pork—Pigeons were used as experimental animals and the controls were fed a basal diet practically devoid of antineuritic vitamin B. In experiment No. 1, supplements of beef and pork were used. Five per cent fresh ham protected pigeons against polyneuritis for 70 days; 10 per cent fresh ham protected pigeons at the same time; and 20 per cent dried beef failed to protect against polyneuritis and loss of weight, but 40 per cent dried beef protected the birds for 70 days.

A second experiment was performed in which the rice in the basal ration was heated 1½ hours under pressure to destroy any antineuritic vitamin present, as against unheated rice for the first experiment. Pigeons on the basal ration developed polyneuritis earlier than in experiment No. 1. Neither 5 nor 7.5 per cent of dried baker's yeast prevented polyneuritis. Five per cent of dried brewer's yeast offered protection for at least 8 weeks but one bird developed the disease on the 40th day. Dried beef in the amounts of 12.8, 21.4, and 34.2 per cent was tried but the maximum was hardly sufficient as a protective, one pigeon in this lot developing polyneuritis. Five per cent of smoked ham protected all pigeons in this experiment against polyneuritis for 8 weeks. Albino rats were used in testing water-soluble B vitamins, the controls being fed the basal ration until gain in weight stopped. Three lots of fresh and two of dried ham in amounts varying from 10 to 24 per cent were fed and no material difference noted; good growth and gain in weight resulted when the percentage of ham was 15 or more. Dried fresh beef was tested for water-soluble B vitamins in 4 lots, 40 per cent supplement being insufficient for material growth. On 70 per cent supplement the rats grew rapidly. For comparison purposes it was found that dried brewer's yeast in 5 per cent supplement and baker's yeast in 7.5 per cent furnished sufficient water-soluble B for excellent growth.—Ralph Hoagland, *J. Agri. Res.,* 38: 431 (Apr. 15), 1929.

The Effect of Heat on the Antineuritic Vitamin of Milk—This investigation covers three types of dried milk: one, made by the spray process; a second, made by superheated rollers, and a third, a desiccated albumin milk. In addition, tests were made of commercially pasteurized and home pasteurized milk, and of milk quickly boiled. Various mixtures of these preparations were given to suckling rats whose mothers were on high protein ration. Tables are given showing the various supplements to the ration and the gain and loss in weight of the animals. The results indicate destruction of the antineuritic vitamin in all of the superheated milk except that made by the roller process. Similar results are apparent in the milk pasteurized by the open method, while that pasteurized by the closed method showed no vitamin destruction. Milk heated to boiling temperature quickly and cooled slowly is severely affected, while the same milk cooled quickly shows no adverse effect. The authors conclude that temperature and aeration are important factors in the destruction of the antineuritic vitamin. —Amy L. Daniels, Mate L. Giddings, and Dorothy Jordan, *J. Nutrition,* 1: 455 (May), 1929.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

The Nursing Division of the League of Red Cross Societies—At the time of the foundation of the Red Cross Societies at Geneva, in 1864, there was recognition of the value of nursing as an indispensable part of its activities, and recommendations were made from time to time relative to the type of person best fitted for nursing service. Ever since 1907, there have been peace-time programs in the Red Cross Associations for training nurses in the care of the sick either through short special courses, or the formation of training schools attached to hospitals, with the idea of preparing them for participation in any emergency such as war, epidemics, or floods, which might arise.

Since the World War, the conception of the nurse's function has broadened to conform to our larger viewpoint in regard to health work. At the medical conference in Cannes in 1919, it was recommended that a department of nursing, under the direction of a qualified nurse, should be organized as part of the League of Red Cross Societies. The purpose of this department was to assist the Red Cross Societies in their different countries, and to establish a postgraduate training center. Certain resolutions about the needs in regard to nursing service were drawn up at that time.

Soon there followed the formation of the Nursing Advisory Board, representing various nursing organizations from different countries, and the recommendations of this board, which were accepted by the Third General Conference of the League in 1924, were in line with the resolutions introduced in the earlier conferences. They were:

1. That the development of nursing should form a vital part of the program of each national Red Cross Society.
2. That societies should endeavor to stimulate the development of schools of nursing of the highest order in their respective countries provided that institutions of this character do not exist.
3. That, in future, national Red Cross Societies should designate as Red Cross nurses only those graduated from these schools of a high order, and that the group of women trained by Red Cross Societies for emergency purposes be designated by some such title as "Voluntary Aid Detachments," or "Sanitary Aids," and should serve under enrolled Red Cross nurses.
4. That national Red Cross Societies should promote the efficient education of public health nurses, whenever the Red Cross Society is engaged in health activities where public and private organizations look to the society for assistance in health work.
5. That national Red Cross Societies should endeavor to promote in the minds of the public in their respective countries the national importance of the nurse, and to work for the advancement of nursing education and the improvement of the social and economic status of the nurse.
6. That national Red Cross Societies should enroll in a nursing reserve all the qualified nurses in their countries who would be in a position to respond in time of war, disaster, or epidemic.
7. That each national Red Cross Society should appoint an advisory nursing committee of leading nurses and representatives of the medical profession, and of the health, educational and hospital authorities, to study the needs, determine the activities, and guide the development of any activities undertaken by the Red Cross.

Since then, the Advisory Board has been altered to a small Advisory Committee representing different racial groups, with an *ex officio* representative from the International Red Cross Committee, and a representative of the country in which the meeting is being held.

The two international courses for

postgraduate instructions, organized according to the original recommendations, have up to the present time received about 141 students from different countries. The schools are centered in London at Bedford College for Women, in conjunction with the College of Nursing; one being a course in public health, and the other a course for nurse administrators and teachers in schools of nursing. A permanent residence for the international students is maintained at 15 Manchester Square.

A further activity of the League in regard to nursing has been the loaning of fully trained nurses to countries having no training schools, for the purpose of starting schools according to the methods now accepted as standard in western countries. These schools have been undertaken with the idea that they were to be transferred to native graduate nurses as soon as possible for permanent development. Sometimes, where the need of certain countries has been for money to maintain schools rather than for nurses, this has been supplied through the League. There are now about 160 schools of nursing in different parts of the world, conducted by the Red Cross Societies. Public health nursing is being incorporated in the training as much as possible, and travelling scholarships have made foreign study possible.

Public health activities in maternal and infant welfare, tuberculosis, and school nursing, have made possible advances in sections of the world formerly untouched by health work. In disaster relief, the public health nurses have given their usual prompt and efficient aid.

In assistance to Red Cross Societies in their own countries, the activities of the Nursing Division may be described as follows:

Setting up a clearing house for information on nursing subjects, and collecting, compiling and distributing information on the development of nursing in different countries for the use of Red Cross Societies

Maintaining a package library on nursing and associated subjects

Continuing an advisory relation with students who, having completed the International Course, are at work in their own countries

Providing pictures, films, exhibits, pamphlets on nursing

Preparing or securing articles for *The World's Health*

Offering advisory service to national Red Cross Societies through correspondence, visits at League headquarters and visits to the individual Society

Promoting regional Red Cross Conferences for nurses.—

Elizabeth Gordon Fox, Out of an Idea Has Grown a Great Pioneer Service, *Red Cross Courier*, VIII, 9: 25 (May 1), 1929. K. E. P.

Grant for Dental Research—Nowadays, dentists send periodic gentle reminders urging that teeth need attention, so we take our courage in hand and go, realizing that if we preach prevention it is just as well to practice it. Before long, we may know the reasons underlying the need for prophylaxis. The Yale School of Medicine has effected a plan for intensive study of the teeth in relation to the body in general, and a grant from the Rockefeller Foundation has made the project possible.

A study group composed of physicians, surgeons, radiologists, bacteriologists, dentists and pathologists has been formed, with Milton C. Winternitz, M.D., Dean of the Yale School of Medicine, as chairman. Clinical investigations of the condition of the teeth and the bacteria to be found at their roots will be carried on in coöperation with fundamental research in the structure and function of the teeth in health and disease. The germs found at the roots will be isolated and studied in relation to germs found in the mouth and in other parts of the body, and their effect upon the organism. The purpose is not to interfere with training in dental technic as now practiced in schools of dentistry, but to create a group of medical specialists in teeth. Each year from 2 to 4 graduates of dental schools will be admitted to the School of Medicine to continue their medical studies and to work with the dental pathology study group.

How Is Your Blood Pressure?—What blood pressure is:

Circulation of the blood through the arteries, capillaries and veins takes place through the exertion of constant pressure of the blood stream against the elastic walls of the arteries.

This degree of pressure varies constantly, depending upon activity. The highest point of pressure is reached during the time when the pulse "beats" and is called the systolic pressure. The lowest point, the diastolic pressure, represents the degree of pressure existing between "beats." The variation in the levels to which these two points rise and fall is not great in the normal person. But a condition in which the degree of systolic and diastolic pressure remains at too high a level is an accompaniment and perhaps a contributing cause to many serious middle-age and old-age diseases. This condition is known as hypertension and is one which develops slowly, aided markedly by wrong habits of living. It is much easier to prevent than to cure.

How to avoid hypertension:

The prevention is mainly through the avoidance of physical or emotional excesses. The way you live and think now is going to have far more to do with your blood pressure 50 years from now than any amount of medicine you can take then.

A few good suggestions are:

1. Moderation in eating, smoking, drinking, exercising, and any activity which worries you or tires you out
2. Regularity in eating, sleeping, bathing and eliminating
3. Ruling fear and anxiety, especially about yourself, out of your life

For the older person with high blood pressure, a quiet life and a contented mind will do more than all the medicine in the world to reduce it to lower levels. Periodic consultations with the doctor are necessary for the maintenance of health.—Norman B. Cole, How Is Your Blood Pressure? *Hygeia*, 7, 5: 459 (May), 1929. K. E. P.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

How to Get Exhibits Done—There are many possibilities for the resourceful and lucky person to enlist volunteers for various kinds of exhibit construction.

There are skilled and enthusiastic amateurs in all types of craftsmanship who might be enlisted if your project is appealing to the particular individual whose aid is desired—workers in metals, wood, cardboard, electricity, chemicals, photography, and so on.

Instructors in the above may sometimes be interested in doing what you need—because of interest in the craft or the appeal of your work.

There is always the possibility that the commercial specialist may become interested in your particular project, and be willing to make a contribution of service or material, although this approach must be as carefully guarded as a request for a financial contribution.

Individuals or groups of unskilled volunteers—neat, systematic and interested—may do certain types of work: cutting, pasting, and other simple operations.

The executive or the exhibit committee may be relieved of many errands; much detailed effort in locating or check-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

ing up on commercial specialists; searching for materials for certain uses; gathering particular information. The volunteer may use the telephone to interview people, write letters, or search in books as the job may require.

A "Census of Useful People" will lay the foundation for securing desirable volunteers for future needs. See pages 201–202 in *The A B C of Exhibit Planning*—to be found in local libraries.

Again—it may be urged that experience has shown that capable people have been enlisted in exhibit construction who have had no previous contacts with the work of the agency or who had revealed no interest whatsoever in its field of work—but they *did* become interested in doing their specialty on behalf of the agency.

"Publicity as a Motive Factor"—The Health Division of the National Conference of Social Work held one joint session with Educational Publicity Division at San Francisco, June 26–July 3. "Publicity as a Motive Factor in Health Education: The Psychology of Motives; How Health Publicity Is Planned to Put Motives to Work," will be a further development of the theme considered by the Public Health Education Section of the A. P. H. A. at Chicago.

There were 19 sessions on publicity at San Francisco, with exhibits, and health workers prominent among those present.

A Panorama Exhibit—The old-fashioned panorama—even now to be found in miniature forms in toy stores—may be adapted to exhibit uses. The visitor sees an open box or simple stage front in which appears a series of pictures, with brief captions. The pictures move horizontally across the back of the stage, or perpendicularly from top to floor.

The continuity of pictures and other material will be mounted on a continuous strip of tracing cloth or other material, running over several rollers. Simpler construction will be possible by omitting the continuous feature, and winding from one roller to another, and re-winding after each showing. The winding can be by sand wheel or electric motor, or by a crank turned by a visitor or attendant.

The captions may run along with the story or may be displayed in an adjoining stage front. In this case the captions and pictures will run from top to bottom, with both "shows" mounted on the same axle or shaft so that there will be exact synchronization.

The story may be made up with pictures cut from magazines, or may be sketched by an artist or by children, or may be silhouettes. If the latter, the moving curtain should be tracing paper so that with a moderate light behind the pictures will stand out boldly.

Help the Health Editors—The editors of health journals and organs of health agencies receive many copies of pamphlets and other printed matter, usually without the information needed for intelligent comment. Is the material for sale? Is it available for free distribution? Terms? Will single copies of a report or folder be supplied as samples to health workers? Free, or for how much?

Many state or local publications are more interesting if the reader can learn the cost, the process used, the number of copies, and who received them. And frequently the reader needs to know why a publication was issued, or the result desired.

Judging by our own experience, life is too short for the editor to write for this information. Sometimes it is done, but usually we must do the best we can—give the surface information, or drop the publication into the waste basket.

Incidentally, more samples from the

field should reach the editors and the offices of the national health organizations.

Exhibit Ideas from Books and Other Sources—Many ideas to adapt to exhibit or display use may be found in books on handicraft or home amusements.

Toy stores will suggest forms which may be made over and be used to express a health idea or fact.

Window displays will include devices which may be copied or adapted.

Outside Wondering What's Inside—For school or exhibit purposes:

1. A box—set on a table or stand—with an exciting title at the top.
2. Inside are 4, 5 or 6 photographs or sketches or silhouettes or transparencies telling some health message—mounted on an axle or drum so that the visitor can revolve and see the pictures in turn.
3. The handle will project from both sides—or either side—and probably with a clutch so that it can revolve only in one direction.
4. A hole in the slanted top through which the pictures can be seen as they revolve.

In practice it may be possible to have the box larger—with 2 or 3 openings so that several people can look at a time.

RADIO

"Universal Safety Series" is presented by the National Broadcasting Co. in conjunction with the National Safety Council, running through the middle of July, on Saturdays at 7:15 P.M., Eastern Daylight Saving Time.

The dialogue, well done, is an acceptable form for broadcasting health.

Simpler to work out, and effective, is a series of questions and answers. Writing the questions, especially, offers the chance to enliven the period on the air, and, of course, the answers should not be heavy even though they may be straight statements of fact.

Questions about health and health agencies could be put to a prominent citizen who has not seen them in advance, asking the audience to determine whether or not he gives the correct answers, that is, provided you have an opportunity to present the correct answers a week later.

A group of exploded health superstitions should provide interesting material, with a good chance to bring in the reasons for modern health practices.

Something in the nature of a "stunt," like one of the above, given now and then may serve to attract new listeners, or bring back some who have tired of the routine radio talks on health topics.

POSTERS

A help toward better posters and placards is the study of the best of advertising posters. A stimulating aid in that direction is "Posters and Publicity," edited by Mercer and Guant, *The Studio*, London. It is an introductory review of poster art, and 140 pages of posters, booklet and folder covers, and a few advertisements. Many countries are represented. William E. Rudge, 475 Fifth Ave., New York, N. Y. *Cloth $4.50, paper $3.00.*

Instead of being devoted to specific information, graphically presented, many of the best posters now attempt nothing more definite than the creation of a mood in the spectator. They still hold to the old rules which have been tested by centuries of use. They remain simple summaries, direct, taken in at a glance, easily remembered. But they have in many instances dropped the insistence on a special fact to be conveyed, and prefer to make the information supplementary or incidental to the feeling. If the article advertised is represented in an atmosphere which induces friendliness in the spectator, the extra "punch" of a slogan is thought to be detrimental rather than helpful.—
New York Times, Dec. 17, 1928.

EDUCATIONAL MATERIAL

An example of coöperation by non-health movements is *Mother's First Book*, by Cora Wilson Stewart, published with the coöperation of Cleanliness Institute by the National Illiteracy Crusade, American Red Cross Bldg.,

Washington, D. C. "This book is a first reader for women who cannot read or write. It is for the teacher's use in teaching such women, and by teacher is meant any person who helps a woman to learn." It starts with the baby and what mother can do for the baby, and includes much simple health material. Those who through schools or volunteer teachers can reach illiterate women should write for a *free* copy.

The newest "baby book" is that issued by the John Hancock Mutual Life Insurance Co., Boston, Mass., "Your Baby's Care," by Susan P. Souther, M.D. Photographs and sketches are included, but never both on the same page, a colorful cover, good type and paper, *and an index.* 30 pages—all about the baby. It does not attempt to cover all of childhood. *Free.*

REQUESTS

Please send the editor your answer to this request from a visiting nurse association: "We would like to know where we can secure colored charts showing the different types of eruptions and conditions of the membranes of the throat for use in teacher groups. I am under the impression that Detroit uses something of this kind with its teachers. Can you advise me?"

Something to turn back to is "What Do You Want?" in the *Journal* for December, 1928, page 1546.

REGRETTABLE BUT TRUE

That no publication date appears on the report of a study of the health of a group of boys, issued by one of the largest of the voluntary health agencies. [Careful readers will find buried in the text the date when the study was started.]

That so many health survey reports carry no obvious indication on the cover or title page of the authority responsible for the issuance of the report, and that so frequently no address is given to which communications may be addressed.

CHILDREN AND SCHOOLS

A picture of the tuberculosis double-barred cross as formed by Health Crusaders, in "Fighting Tuberculosis and Heart Disease." Illustrated review of the activities of Tuberculosis and Health Society, 51 Warren St., Detroit, Mich. *4 cents.*

"The Health Land Herald": how a fourth grade wrote a health newspaper. *Hygeia.* Mar., 1929.

The Junior Red Cross calendar for May includes writing news stories on health and on making a plan for health during vacation.

"The straws did the trick," claims the Pine Plains Parent-Teachers' Association because "the mothers report that many of the children who would never drink milk at home are now taking it as a matter of course." Just before the lunch hour each child received a small bottle of milk, a straw and a cracker. The 4-H Club bought the straws.—Reported by Dutchess Co., N. Y., Health Association.

"Teaching Health in Schools," in *S. C. A. A. News,* 105 East 22d St., New York, N. Y., Mar., 1929, describes new project of S. C. A. A. in cooperation with Health and Physical Education Division of New York State Education Department. *Free.*

A wealth of material for school, club and home use is to be found month by month in *Safety Education,* Educational Division, National Safety Council, 1 Park Ave., New York, N. Y. *Sample free.* Every issue includes a separate poster for the classroom or the child's room at home.

Apply to the same address for "Public and School Safety Posters—1929," an illustrated catalogue. *Free.*

BOOKS AND REPORTS

The Balance of Births and Deaths—*By Robt. R. Kuczynski. New York: Macmillan,* 1928. 140 pp. Price, $2.00.

This is the first of the series of population studies contemplated by the Institute of Economics. In the present volume a comprehensive statistical survey is made of the trend of human fertility in Northern and Western Europe. Subsequent studies will deal with fertility in the remaining parts of the world for which data exist. Once the facts as to fertility are known, analyses will be made of the social causes and of the political and economic consequences of differences in fertility. In the reviewer's opinion this is by far the best statistical statement yet made of natural increase in the territory studied. Provided the contemplated studies maintain the high level of the present one, an end will shortly be made to the countless factually unsupported statements made by many ill-informed writers on population.

The data and conclusions presented and the method employed will be of value to population students, for Dr. Kuczynski, one of the outstanding statisticians of Europe, applies a method designed to show whether the populations of the European countries studied are maintaining themselves; that is, neither potentially increasing nor potentially decreasing. This method, hitherto practically unknown to Americans, will be understood by any high school student.

At present the population of Europe contains an unduly large proportion of women of childbearing age, and an unduly small proportion of children and aged persons. This age composition in turn makes for a high birth rate and a low death rate. Consequently the excess of births over deaths gives no true picture of the underlying trend. Dr. Kuczynski's method, despite its simplicity, gives as true a picture of the fundamental trend as some of the involved mathematical methods employed in this country.

So far as Northern and Western Europe is concerned the Malthusian devil, if not now chained, soon will be, according to Dr. Kuczynski's findings. At present 100 mothers give birth to but 93 future mothers. "With a fertility and a mortality as they prevail at present, the population of some smaller countries still shows a genuine growth, but the population of the larger countries, France, and especially England and Germany, is doomed to die out." While an essential change in mortality or in fertility can halt this trend, the future "depends mainly on the trend of fertility," for future reductions of mortality in the childbearing years cannot be very great.

Whereas the average number of children per woman (married and unmarried) was 4 or 5 forty years ago in all the countries studied except France and Ireland, the average in 1926 had fallen below 3 practically everywhere and was but 2.3 for the area studied.

The chapter on birth rates shows that birth rates declined continuously during the 19th century, nor did the World War essentially change this trend. By 1927 the birth rates of Denmark, Sweden, and Switzerland had fallen below that of France. Eventually, it appears, rates of the same magnitude will prevail in all the countries studied.

No public health statistician or population student can afford to be without this book, which, in addition to all its

other merits, contains a mine of carefully corrected birth rate and other vital statistical data.

JOSEPH Y. SPENGLER

Hygiene and Public Health (*Parkes and Kenwood*). (*8th ed., rev.*)—*Revised by Henry R. Kenwood, C.M.G., M.B., and Harold Kerr, O.B.E. Philadelphia: Blakiston,* 1929. 823 pp. Price, $7.00.

The present edition of this work—the eighth of the joint authorship—has been prepared by Professors Kenwood and Kerr, though the name of Dr. Louis C. Parkes, who originated the book, and for many years was its sole author, is still retained.

Few books have been before the medical public longer than this, and it is safe to say that none have retained their popularity to a greater extent. All editions have been favorably received, not only in England, but in this country, as a result of real merit.

The present edition has been brought up to date, and is a worthy successor to those which have preceded it. The only drawback for American readers is that rules and regulations concerning housing, tuberculosis, milk, etc., are those official in England. The principles, however, are equally applicable in this country.

The printing and make-up are excellent. The book can be recommended without hesitation as a text and reference for all those interested in public health.

M. P. RAVENEL

Five Years in Fargo—*Report of the Commonwealth Fund Child Health Demonstration in Fargo, N. D., 1923–1927. New York: The Commonwealth Fund Division of Publications.* 207 pp. Price, $1.00.

Public health administrators and all volunteer workers in the field of public health will welcome this excellent account of the most interesting and successful health demonstration yet reported. Those who contemplate enlisting community support for similar demonstrations or who plan any sort of progressive, forward-looking health program can do no better than study this report.

Fargo is a strategic point geographically. Wide-awake, progressive groups of practicing physicians, interested from the standpoint of scientific medicine, with the citizenship generally interested in promoting the " boost " spirit to make the " biggest little city in the Great Northwest the biggest little city in the world," must have convinced the committee of award that Fargo would be sure to win if given the opportunity for a real health demonstration.

It is refreshing to one in the public health field to note the frank appraisal of each activity in this final evaluation. Application of the rating schedule of the American Public Health Association, worked out originally on the score of 86 smaller cities, proves to the satisfaction of every student that this demonstration was well worth while. As was to have been expected, the greatest gains demonstrable by such a rating schedule occur in the special fields related to maternity, infancy, preschool age and childhood. That the general rating score should have increased from 320 points out of a possible 1,000, the year before the demonstration began, to 827 during the last year shows how largely public health results may be determined by concentrating upon these appealing programs.

To see vital statistics increase within a 5-year period from a score of 16 to 56 out of a possible 60 points in the rating schedule, communicable disease control leap from 69 to 155 out of a possible 175, prenatal service reach the maximum score allowed in the rating schedule, infant service approach the full allowance by reaching 69 out of 75, preschool service acquire the full ap-

praisal value of 50 points, school health service score 141 out of 150 points, and the laboratory activities reach the maximum rating during the last two years of the demonstration, should convince anyone of the value of the experiment..

The per capita cost of $1.59 is well within the financial reach of any forward-looking community. Those who figure in dollars and cents, and who question whether a well worked out health program may be fully sold to a community, need not go beyond pages 49 and 50 to be convinced of the monetary value of extensive health activities properly demonstrated.

The City of Fargo annually increased its health funds from $20,663 in 1922, and $24,132 the year the demonstration began, to $36,000. At the end of the demonstration when Fargo took over all activities, the total budget for health activities was $40,600.

The growing interest shown by the teachers and the mothers of school children examined, and that kept up by the various community service clubs and the public press, all tend to prove in a most practical way that the community realized its full responsibility, and heartily joined in a sort of co-partnership with the director of the demonstration, his staff and the medical profession in assuring success.

This little volume should be in the library of every public health administrative officer and every volunteer health organization.

B. FRANKLIN ROYER

The Facts of Modern Medicine. *A Simplified Statement of Established Knowledge on Medical Subjects, with Reference also to Certain Current Misconceptions—By Francis W. Palfrey, M.D. New York: Appleton,* 1929. 490 pp. Price, $5.00.

As stated in the preface, the author had two objects in the preparation of this book: to lessen the gap between the knowledge of medicine common to the general public and that of the medical profession; and to give to students a preliminary view of medicine drawn in a broad outline, but with its parts in true perspective. While we doubt the wisdom of this dual purpose, we believe that the book will come as near to fulfilling its object as possible.

As a book for the layman, it is excellent—accurate in detail and well written —perhaps a little bit too smoothly to hold the reader's attention.

The illustrations are good, the microphotographs especially so, though we cannot help wondering what the average layman will make out of some of them. Probably they are put in for the beginning medical student. An excellent crayon portrait of Osler, by Sargent, faces the title page.

The printing and general make-up of the book are excellent.

M. P. RAVENEL

Animal Parasitology—*By Robert Hegner, Francis M. Root and Donald L. Augustine. New York: Century,* 1929. 731 pp., 280 figs. Price, $6.50.

This book gives the gist of the instruction in protozoölogy, helminthology and medical entomology as offered at the School of Hygiene and Public Health of Johns Hopkins University, and provides an adequate and comprehensive single textbook in parasitology which utilizes some of the large amount of valuable material accumulated by the International Health Board and other agencies of the Rockefeller Foundation.

The attempt to cover so large a field within the compass of 600 pages is disastrous, in that illustrations are of necessity reduced; the text becomes more or less a thinly clad skeleton; and the proportion required for the necessary commonplace matter is large. The attempt to include the parasites of the domesticated animals is very incom-

pletely carried out, a few of the better known being rather superficially treated. This information is of value to students of biology, but is quite inadequate for veterinary purposes. The book has only about half as many pages and illustrations as the section dealing with animal parasites in the well-known *Précis de Parasitologie,* of Brumpt, which treats only of human parasitology.

The work falls into three equal sections. The first, on protozoölogy, is by Professor Hegner of Johns Hopkins School of Hygiene and Public Health, the second by Professor D. L. Augustine of Harvard Medical School, and the third by Professor F. M. Root, a colleague of the first named author. The section on protozoölogy is a condensation of the author's books *Human Protozoology* and *Host-Parasite Relations,* with some additions which make the treatment somewhat more comprehensive.

The second part is less satisfactory in its treatment of the Platyhelminthes than in that of the Nematheiminthes, where much new material is assembled concerning hookworm, hookworm surveys and campaigns. There is little new in the way of illustrations, old friends which have appeared in every textbook since the days of Leuckart still adorning the pages of this latest work, whiie some of the new ones are no improvement over the old. The chapter on methods will be very welcome to all public health laboratory workers.

The closing section on medical entomology covers a large field and has been handled with skill. There are new and significant illustrations, carefully worked out keys, clean-cut accounts of measures for control and prevention of insect vectors, and discussions of the relations of insects to various diseases.

The bibliography is extensive, perhaps needlessly extended, and printed in larger type than necessary. A more careful handling of the typography, size of illustrations and set-up would permit a considerable gain, either by reducing size and cost, or increasing the text and illustrations without increase of pages.

This book will be of particular value to technicians in public health laboratories and as an important work of reference for public health workers. Preventive medicine has made some of its most inspiring and noteworthy contributions through research in parasitology. Every worker in this field should review the achievements in this field as presented for inspiration, and face anew the problems which he will find assembled in this comprehensive, authoritative and up-to-date work. C. A. KOFOID

What Everyone Should Know about Eyes (*National Health Series*)—*By F. Park Lewis, M.D. New York: Funk & Wagnalls,* 1928. 70 pp. Price, $.30.

Much valuable information for the layman is crowded into this little book. The mechanism of sight is first explained, particular attention being directed to near-sightedness and squint. Reasons for, and methods of, examination are so outlined that the reader may visualize the procedure.

Part II considers trachoma, birth infections, accidents and injuries, showing how our knowledge of preventive measures has been increased.

The author has recognized the necessity of education in regard to diseases affecting the optic nerve, cataract, iritis, and glaucoma; also pointed out the changes that take place in the eye in old age.

The final chapter on hereditary eye defects answers some questions and provokes thought. Dr. Lewis is to be commended for presenting useful scientific information in popular terms, thus rendering admirable service to the cause of education. CONRAD BERENS

Why Not Grow Young? or Living for Longevity—*By Robert W. Service. New York: Barse*, 1928. 266 pp. Price, $1.50.

Youthful Old Age. How to Keep Young—*By Walter M. Gallichan. New York: Macmillan*, 1929. 236 pp. Price, $2.50.

We confess frankly that we are tired of books written by non-medical men who think that some fad or another has saved their lives and preserved their health. Public health is popular, and we cannot help suspecting that the financial element is back of some of the apparent desire to spread alleged information.

Both of the books mentioned above are well written—that by Mr. Service in a breezy, robust style, which makes it very attractive, that by Mr. Gallichan in a more conservative and philosophical style, which, however, is pleasing.

One cannot but be astonished at the cocksure tone which both exhibit. Verily, verily, mortals rush in where angels fear to tread. Even the question of blood pressure presents no difficulties to Mr. Service. His fad is Royat, and he even goes so far as to make the absurd statement that physicians will not endorse Royat because their business is to cure by drugs rather than nature, and knowing what Royat will do, "they will lose a profitable patient." He gives 100 "do's and don't's" for the middle aged man, which compels one to wonder why he should be more of a fool before 50 than after, as far as the preservation of health goes.

Mr. Gallichan is an author of parts, proudly claiming 52 volumes for his 67 + years. He has developed a philosophy of life which is attractive. If his knowledge equalled his philosophy, we would have no fault to find. He is evidently a disciple of Sir Arbuthnot Lane.

Both authors have read widely without the fundamental training necessary for understanding. Both of them attribute their health to their fads instead of to a God who has been kinder to them than to the public in allowing them to continue their writing.

We cannot but remember the story of Bishop Berkeley, of whom it was said "To Berkeley every virtue under heaven." In spite of his learning, to him tar water was a panacea for every ill—mental, spiritual and physical. As Oliver Wendell Holmes put it, he was a great and good man, but held two very peculiar ideas—that the material universe and all it contained was nothing, while tar water was everything. As expressed by the same beloved physician, his life illustrated a point which Messrs. Service and Gallichan might well take into account:

> Berkeley himself afforded a remarkable illustration of a truth which has long been known to the members of one of the learned professions, namely, that no amount of talent, or of acquirements in other departments, can rescue from lamentable folly those who, without something of the requisite preparation, undertake to experiment with nostrums upon themselves and their neighbors.

M. P. RAVENEL

Proceedings of Sixth Annual Short School Texas Association of Sanitarians. *Assembled at San Antonio, Texas, November 7–10, 1928. Austin: Texas Association of Sanitarians.* 188 pp. Price, $1.00.

These proceedings contain the usual amount of interesting and instructive reading. Health education receives the largest proportion of space and includes discussions of such subjects as "Coöperation in Public Health by Veterinarians" and "The Plumber and His Trade."

Communicable diseases and foods and drugs are allotted sections of the journal. In the first of these there is an able paper on the effect of rat extermination on health and economy.

Fifteen pages are given over to water sanitation, and following that various

phases of sewage treatment are discussed. In the later section, Mr. Guzman of the University of Mexico outlines briefly sewage disposal conditions in his country.

In the back of the book 40 pages are needed to give the public health and welfare organizations and allied groups in Texas; lists of the dairies, creameries, licensed veterinarians, public health nurses and master plumbers; and a proposed state plumbing code.

ARTHUR P. MILLER

Advice to the Expectant Mother on the Care of Health—*By F. J. Browne, M.D. Edinburgh: E. & S. Livingstone,* 1928. 48 pp. Price, $.50.

The benefits to be expected from regular physical examinations during pregnancy are directly and simply stated. What might be termed the standard information on prenatal hygiene, the common disorders of pregnancy, and the general care of the new-born baby are concisely given. The symptoms and importance of the more serious disorders are clearly explained.

This small book gives in the most orderly fashion and in easily understandable language all that is important, without unessentials. C. E. HAYES

Protozoology. *A manual for medical men—By J. G. Thomson and Andrew Robertson. New York: Wood,* 1929. 376 pp., 4 col. pl., 220 figs. Price, $11.00.

This manual of protozoölogy differs from the numerous others in this field in that it is written by medical men for medical men, but without discussions of therapy or epidemiology. It deals with malaria (64 pp.), coccidiosis (16 pp.), babesiasis (4 pp.), amebiasis (38 pp.), intestinal flagellates (26 pp.), leishmaniasis (21 pp.), trypanosomiasis (29 pp.), spirochetes (12 pp.), syphilis, yaws, etc. (11 pp.), leptospirosis (7 pp.), and other minor protozoan infections of man. Epecially valuable are the discussions of the pathologies of the various protozoan infections, notably that of malaria, in which field the senior author is a world authority.

The authors have had access, through their connections with the London School of Tropical Medicine, to large collections of autopsy material and have rendered a great service to protozoölogists and medical men alike in their judicious and ample use of this illustrative material and their comprehensive discussions of it. There is a valuable chapter on fallacies and puzzles in blood examination, and another on common objects in stools other than protozoa. The chapter on coccidiosis has new material showing sources of contamination in human feces from the coccidia of the sardine.

There are many new illustrations. The four colored plates are excellent, but many of the photomicrographs exhibit poor technic in photography or reproduction, or both. Some of the text figures are quite crude, with little attention to cytological detail, and are unduly enlarged in many instances, thus adding materially to the cost of an already quite expensive book. There is a good chapter on the various technics of fixing, staining and preparation of culture mediums, an etymological glossary and a full index. C. A. KOFOID

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Typhoid Fever—The annual compilation of municipal typhoid fever death rates by sections. The southern states, as usual, are higher than elsewhere in the country, but their rates are lower than for previous years. The record as a whole is a good one. Nine cities had no deaths.

Typhoid in the Larger Cities of the United States in 1928. J. A. M. A., 92, 20: 1674 (May 18), 1929.

Diphtheria Death Rates—The same statistical comparison of municipal experience in relation to diphtheria. Eleven cities had death rates of 2.0 or less (Grand Rapids 0.0) and 10 had rates between 20.0 and 14.6. Food for much thought, speculation and mutual recriminations.

——. Diphtheria Mortality in Large Cities of the United States in 1928. J. A. M. A., 92, 21: 1759 (May 25), 1929.

Antarcesis—Suggested by the author to designate protective power against disease born of normal or balanced physiological activity as distinguished from immunity resulting from invasion. The paper is about variations in incidence of poliomyelitis, and is a good one.

AYCOCK, W. L. A Study of the Significance of Geographic and Seasonal Variations in the Incidence of Poliomyelitis. J. Prev. Med., 3, 3: 245 (May), 1929.

Watershed Protection Practice—A symposium on protecting potable water supplies by five local representatives, and from the standpoint of the State Board of Health. Very interesting for those who are faced with this vexing problem.

BURT, JOHN, *et al.* Watershed Protection Practice in California. J. Am. Water Works A., 21, 5: 589 (May), 1929.

Anti-Tuberculosis Work—Sound comments on a quarter century of tuberculosis preventive measures, with emphasis on doctor-patient relationships.

DEVINE, E. T. The Quarter Century Health Crusade. Survey, 62, 4: 229 (May 15), 1929.

Care of Chronic Cases among Children—Telling of the measures taken for the care of chronically sick children in Boston. One-sixth of all chronic cases are children.

EAVES, L. Children Who Are Chronically Sick. Survey, 62, 4: 241 (May 15), 1929.

Camp Sanitation—Points are listed which should be observed in inspecting summer camps.

FELSEN, J. A System of Classification of Summer Camps. J. A. M. A., 92, 21: 1789 (May 25), 1929.

Medical Student Health Examinations—How Harvard medical students are impressed with the value of health examinations. Each student receives at least four examinations and gives at least two to other students. They become interested in the follow-up of their own cases and try to keep fit. Is it too much to expect that this so evidently sensible scheme will be adopted in all medical schools?

FITZ, K. *Periodic Health Examinations* as a Part of a Medical Student's Curriculum. J. A. M. A., 92, 20: 1645 (May 18), 1929.

Anti-Malarial Measures—A dusting outfit is described by which Paris green mixed with lime may be applied effectively to waters in which anopheline mosquitoes breed.

LE PRINCE, J. A. Development of a Power Dusting Device for Applying Paris Green as an Anopheline Larvicide. Pub. Health Rep., 44, 17: 1001 (Apr. 26), 1929.

Tuberculosis Skin Test—The simple and reliable percutaneous tuberculin reaction described is suggested in preference to other procedures because it is easier to do and causes less discomfort to the patient.

LOVETT, B. R. The Percutaneous Tuberculin Reaction. Am. J. Dis. Child., 37, 5: 918 (May), 1929.

Rural Health—Tables are given showing increase by counties in rural health administration. Despite the increase, more than 77 per cent of the rural population has no adequate health service.

LUMSDEN, L. L. Extent of Rural Health Service in the United States, 1925–1929. Pub. Health Rep., 44, 20: 1192 (May 17), 1929.

The Year in Public Health—Some of the high spots in 1928 are reviewed; the activities of the federal health service, the several funds, and progress in biologic and economic research are included.

MOORE, H. H. Progress in Public Health and Medicine, 1928. New England J. Med., 200, 20: 1045 (May 16), 1929.

Etiology of Poliomyelitis—Evidence is offered supporting the view that a streptococcus (as suggested by Rosenow) cannot be regarded as identical with the filtrable virus of poliomyelitis.

OLITSKY, P. K., *et al.* Relation of Streptococci to the Spinal Fluid of Experimental Poliomyelitis. J. A. M. A., 92, 21: 1725 (May 25), 1929.

The Decline of Nations—One of those vague, "What causes that?" dissertations evidently so dear to the heart of the Britisher. All about the troubles that came to Greece and Rome. The author casts a worried eye to America and shakes his head over us. Wealth, luxury and vice are prominently mentioned.

OLIVER, THOMAS. Some Factors Which Have Made for the Decline of Nations. Med. Off., 41, 19: 201 (May 11), 1929.

Leprosy—The so-called leprosy bacillus is an actinomyces, a soil organism of wide but irregular distribution. Leprosy is primarily a soil infection presumably through wounds. These conclusions will change our conception of rational control measures, if they are generally accepted.

WALKER, E. L. Some New Aspects of the Etiology and Endemiology of Leprosy. J. Prev. Med., 3, 5: 167 (May), 1929.

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SHERMAN, H. C. The Problem of Sweets for Children. Child Hyg. Bull., 5, 3: 65 (May), 1929.

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TUNNICLIFF, R., and CROOKS, T. T. The Healthy Carrier in Scarlet Fever. J. A. M. A., 92, 18: 1498 (May 4), 1929.

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ANNUAL REPORT OF THE DEPARTMENT OF HEALTH, BUFFALO, N. Y. Year ending December 31, 1928.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Fort Worth, Tex.—A health and welfare survey and appraisal of the city of Fort Worth by the Director of Public Health and Welfare is a document of 140 mimeographed pages of unusual interest to health and welfare administrators. The new city appraisal form has been utilized for the health survey, and on a similar basis, an appraisal of welfare work has been developed. The latter form is the first of its kind which has come to the attention of the reviewer.

This city of 191,448 population reports a birth rate of 15.5, a death rate of 10.5 and an infant mortality rate of 77.9. There are 12 hospitals and clinics in the city with 708 beds, 585 for white, 101 for colored and 22 for day patients. Exclusive of the Independent School District, there are 41 colleges and schools of different character in Fort Worth. There are about 22 agencies doing health and welfare work. There are 201 white physicians, not including the 4 doctors in the Department of Public Health and Welfare, and 11 colored physicians.

About 85 per cent of the milk supply is pasteurized. The major portion of the milk is delivered in the city within a few hours after production, within a radius of 50 miles of the city. There are approximately 10,066 cows producing 19,333 gallons of milk daily. Some 1,519 food establishments are under supervision.

For the purpose of administration and operation, the Department of Public Health and Welfare is divided into 6 separate divisions or bureaus: administration, communicable disease control, nursing, inspection, laboratory, and welfare. All free clinics and dispensaries, maternity hospitals and other hospitals maintained within the city are under the supervision of the director of this department.

Following his recommendations regarding future program, the director makes a plea for unity of purpose.

> The health and welfare of a community should not be bartered or maligned but should be upheld by all who are capable of thinking. "Unity of purpose" should be the watchword, and everyone should carry the message home to some one so that when we pass on we may look back upon an accomplishment that lives on and on. If, in surrendering the personal equation, we may help to serve some child who is unable to think for itself, is it not far better for the community and for our own selves? My earnest plea is that everyone doing any character of work for the promotion of health and welfare unite his or her efforts for a common achievement.

New Mexico—The fifth biennial report for 1927–28 carries on the inside of the front cover 21 items on, "What the New Mexico State Bureau of Public Health Does for You," all at a cost of 7½ cents per person in taxes. There is a table of contents at the front and an alphabetical index at the back. The inside of the back cover lists the bureau personnel and the outside gives an organization chart of the Board of Public Welfare with the bureaus of public health and child welfare.

A comprehensive campaign for complete registration of births and deaths was worked out in coöperation with the U. S. Bureau of the Census, the U. S. Children's Bureau, the American Public Health Association and the Rockefeller Foundation, to be started in the fall of 1928.

Malaria cases appeared in one county in large numbers and led to the introduction of active control measures. Paris green was regularly dusted on all mosquito breeding pools and ditches

throughout the settled portion of the county. Regular checks indicated a large reduction of mosquitoes. Quinine was also distributed to cases and carriers unable to provide it for themselves.

For several years, regular health courses have been advocated in the normal schools. Through the coöperation of the state and national tuberculosis associations, a trained teacher was supplied to two of the normal schools in the summer of 1927. As a result, permanent courses have been established and will doubtless be enlarged. The State University has created a Department of Hygiene with a comprehensive plan for development. The health department maintains a loan library of books and periodicals.

Vermont—An outbreak of rabies early in 1927 and the flood of November of that year receive special consideration in the department of public health report for the biennial period ending December 31, 1927. From February to August, 21 dogs, 4 cows, 1 calf and 3 sheep were found to have rabies, but no human cases occurred. Prompt control measures were exercised by the Department of Agriculture and Department of Health and in March an act relating to the control of rabies was passed by the legislature.

As a result of the flood, some 5,500 persons received typhoid inoculation. It is noteworthy that diseases due to exposure and exhaustion, such as colds and pneumonia, did not occur to any considerable extent. "It is with a considerable degree of pride that we report that not a single case of typhoid fever resulted from the flood, nor was there any epidemic of any kind."

Vermont has been a fruitful field for the study of poliomyelitis and its aftercare. The epidemic of 1914 with 306 cases forcibly called the attention of both physicians and laymen to the disease, and it is an unusual case which is not brought to the attention of the Department of Health within a few hours after being seen by the physician. All cases are then followed up by the research worker and later by the aftercare nurses. "A situation has therefore worked out which offers coöperation on the part of the profession and an interested expectancy on the part of the people." During 1927, 954 patients were under supervision, 183 being new admissions.

Colorado Springs, Colo.—This is another health report attractively illustrated with photographs. Improvement in the water and milk supplies over previous years is noted. The average bacterial count of the milk of 20 dairies producing raw milk during the year was 10,065; the average for 8 producers of pasteurized milk was 14,918.

Three cases of diphtheria, with no deaths, is the record of this city with a population of 36,000. Of the 150 deaths from tuberculosis, only 4 were among persons who contracted the disease locally. There was a crude death rate of 18.03, but the resident death rate, exclusive of deaths from tuberculosis contracted elsewhere, was 11.8. An enlightening analysis of tuberculosis and total deaths is made according to occupation and birthplace. The health department expenditure was $26,176.

Hygienic Institute, Ill.—Printed on soft paper in good sized type, easily read, with a few appropriate photographs of health and hospital buildings, with carefully prepared statistical tables and descriptive text, this report is a credit to the department. The population of the three communities served, La Salle, Peru, and Oglesby, is 30,000, and the budget for the fiscal year ending June 30, 1928, was $38,000. The personnel consists of a medical director, a bacteriologist and chemist, a sanitary

officer, a chief nurse, six staff nurses, a stenographer-clerk, and a general service man. The Institute does the Metropolitan bedside nursing work and in addition offers hourly bedside nursing work to the community. This organization maintains a medical library for the use of local physicians, partially supports a hospital for the isolation of communicable diseases, and conducts a series of infant welfare and other clinics.

An infant mortality rate of 61, a tuberculosis death rate of 34 and a general death rate of 9.2 are noted. There were no cases of diphtheria reported during the year in this entire district. An appraisal of health service has been made for four years and shows a noteworthy increase in attainment from 456 in 1924–25 to 709 in 1927–28. The report concludes with a classified financial statement.

San Jose, Calif.—This city, with an estimated population of 62,750, reports for 1928 a birth rate of 12.7, a death rate of 11.6, and an infant mortality rate of 44.3. There were 669 births attended by physicians, 93 by midwives, and 5 by others. Detailed statistical tables and graphs indicate progress in the reduction of the death rate. "The broad vision of the manager and members of the city council in allowing an increased yearly budget made possible such advancement."

Prenatal cases made 256 visits to clinics and received 599 home visits by the health department. There were 1,349 visits of infants to clinics and 1,626 home visits by nurses. Preschool children made 2,163 visits to clinics and received 3,040 home visits.

Under popular health instruction it is noted that a bi-weekly postcard bulletin is sent to the press, physicians, schools and health workers. The expenditures of the department amounted to $34,469, but there was an additional revenue from inspections, permits and vital statistics of $15,231. Attractive photographs add interest to this annual health department report.

Detroit, Mich.—The greatly increased number of persons reached by the health department through printed educational material and health talks is cited as one of the outstanding developments of the year 1928. This wider distribution of literature has been made possible through the coöperation of insurance companies, milk producers and retail stores. An attempt has been made by the use of letters to keep in closer personal touch with physicians and parents. Many posters have been used. Coöperation with the newspapers has been excellent, with more feature stories, interviews and notices than heretofore.

During the year 1928, the tuberculin testing of all cows on farms supplying milk to Detroit has been carried out. The lowest typhoid fever death rate (1.0), and a decrease in deaths from violence and from automobile accidents are also noted. The general death rate was 11.6 per 1,000 population. Organic heart disease and the pneumonias continue to lead other causes of death by a wide margin.

There are 9 companies supplying bottled water for domestic use, and their plants are periodically inspected. During the year 15,729 food handlers were examined, 10,074 by private physicians and the remainder by the health department. Less than one-half of one per cent were found to be afflicted with a communicable disease.

The psychological effect on the food handler of examination and instruction is important as it keeps in the foreground of his consciousness the importance of his place in the prevention of disease. To emphasize this phase, simple, practical talks are given to food handlers at the time of examination.

The report contains helpful information regarding the work in communicable disease control and child hygiene.

The major emphasis of the school health service during the first half of the school year was placed on diphtheria prevention. The entire medical staff, augmented by extra physicians, devoted its full time to the giving of toxin-antitoxin and the Schick test. Also, more preschool children were reached than previously. The results of prenatal clinic service are indicated by the infant mortality rates. Infants of mothers attending within 16 weeks of pregnancy had a mortality rate of 43.6; those attending within 16–28 weeks, 44.7; and those attending after 28 weeks, 71.4.

"If the prenatal clinic rate had obtained throughout the city, there would be 540 babies alive today who have died."

Hartford, Conn.—This city of 172,288 reports a resident death rate for 1928 of 10.4, a tuberculosis death rate of 71.9, a diphtheria rate of 8.7, a heart disease rate of 208, and a cancer death rate of 105. A birth rate of 18.6 and an infant mortality rate of 62.36 are recorded. It is noteworthy that all of these rates are based on deaths allocated for residence. Expenditures of the Department of Health amounted to $173,412.

There were no deaths from scarlet fever in 1927 or 1928. Eight persons with fever gave the agglutination reaction for Malta fever. In all but one, there was a history of continued use of raw cow's milk from herds known to be infected with contagious abortion. The isolation hospital cared for 59 per cent of the diphtheria cases and 45 per cent of the scarlet fever cases.

Approximately 50 per cent of the resident births occurred in hospitals. Health education work for infants and preschool children is carried on in conjunction with the general health program of the Board of Health and the Visiting Nurse Association. A total of 7,059 children were under observation during the year, with a record of 19,000 visits to health stations and 39,000 home calls by nurses in their behalf.

That the records of vital statistics shall each year be a little more accurate and complete than those of previous years is the aim of this department. The checking of each document received against all previous records having any bearing on it is an important part of this work. The careful study of the causes of death as given by physicians often results in securing information which quite changes the classification of the cause of death.

Palo Alto, Calif.—An interesting, comprehensive report of 19 pages for a city of 12,500! In 1928 there was recorded a death rate of 8.4, the average age at death being 62.4. There were 138 births to residents. For the last 3 years the infant mortality rate has been below 30, and the average for the last 10 years is 42.7, and for 1928, 29.0. There were no cases of smallpox or typhoid fever, and only 5 cases of diphtheria.

After July 1, 1929, it is stated that all milk will be obtained from tuberculin tested cows and the only raw milk allowed will be guaranteed raw and certified.

Health authorities are almost unanimous in believing that the only safe milk is a properly pasteurized milk. Intelligent dairymen are quick to see that their very existence depends upon a safe milk and readily coöperate in improvements such as these.

The health department appropriation amounted to 99 cents per capita.

Newport, R. I.—Newport's health department experienced no staff changes during 1928. The "permanent" population, estimated, was 28,687, with 5,000 additional during the 4 summer months. Deaths from all causes numbered 342, of which 29 were among infants. For 17 months, there have been no cases of diphtheria—a commendable record. A clinic for immunization of preschool children is held each spring. It is in-

teresting to note in the financial statement that $20,262 was expended in 1928, and $29,318 in 1917. The larger expenditure in 1917 is stated to have been due to a diphtheria epidemic for which $17,000 above the usual amount was appropriated.

For the most part the milk supply is obtained from sources within 10 miles of the city. This annual report marks 10 years of enforcement of a regulation permitting the sale of only certified or pasteurized milk. The average bacteria count of pasteurized milk was 27,250, and that of certified milk, 11,981, during the year. It is calculated that local consumers expended $842,404 for milk and cream, on the basis of an average daily consumption of 12,131 quarts of milk and 487 quarts of cream in 1928.

Palestine Survey Commission—The reports of the experts submitted to the Joint Palestine Survey Commission make an impressive volume of 741 pages. The last 204 pages are devoted to a study of the hygiene and sanitary conditions of Palestine in general, with special consideration of the health and well-being of the Jewish people, for whom health work is done by a variety of agencies.

The surveyors found Palestine a country of promise and possibilities so far as health is concerned. It is now in the stage of privy sanitation which all pioneering countries pass through during the course of modernization. It is stated that the problem of public health is largely economic, for the building of adequate water supply systems, the installation of good sewerage and drainage, and the establishment of modern sanitary improvements are very expensive. Public health education will require time and patience and will involve changing the sanitary habits of a large proportion of the entire nation. At present about 15 times as much money is spent for education, and 5 or 6 times as much for police protection, as for health.

Admirable work has been done in Palestine in the prevention of certain infections, notably malaria and trachoma. Prenatal and infant welfare services conducted by the Hadassah have reduced the maternal and infant mortality. It is believed that the next attack should be upon typhoid, dysentery and the diarrheal infections, because they are prevalent and preventable.

The surveyors were favorably impressed with the organization and personnel of the health department. They state that an able group is carrying on the best traditions based on English practice.

Palestine is divided into four geographic districts, each in charge of a medical officer of health, who in turn has assistant medical officers in the various subdivisions.

There are approximately 600 licensed physicians, with over 400 Jewish physicians, or a ratio of 1 to every 400 Jews in the land. Over 1,300 women are registered as midwives. The first regulation for the training of nurses was issued in 1919, since which time over 100 have completed their training and passed examinations for nurses' certificates.

The report emphasizes the need for increased funds for the extension of sanitary facilities and health personnel, together with the possibility of extension of governmental activities to include certain phases of work now carried on by voluntary agencies. The program of Hadassah, the voluntary medical organization, if adequate funds were available, might include expansion of hospital and clinic work, public health nursing and home visitation, public health education and the promotion of mental hygiene.

LEAGUE OF NATIONS NEWS

C.-E. A. WINSLOW, DR. P. H.

THE fourteenth session of the Health Committee was held at Geneva from May 2 to 8, with the president of the committee, Dr. Madsen, in the chair. Two of the three American members, Surgeon General Cumming and the writer, were in attendance.

The report of the medical director indicated satisfactory progress along routine lines. The service of epidemiological intelligence including the operation of the Singapore bureau is proceeding satisfactorily and, aside from the epidemic of mild influenza which has recently prevailed in Europe, there is nothing unusual to note in this field. A peculiarly virulent form of diphtheria has prevailed in several European countries against which ordinary doses of antitoxin are useless. In Denmark, dosage of 500,000 units has been used with success. Sanitary interchanges on industrial hygiene and on rural hygiene have been held this spring and a joint commission of the Health Organization and the International Labour Office has made a study of the relations between sickness insurance organizations and public health services in Germany and Austria. It is planned later to arrange for interchanges dealing with the questions of milk supply, sanitary engineering and housing, and provision will be made in 1930 for a general sanitary interchange in France. A study tour dealing with malaria will be made in India beginning this August.

It will be of interest to Americans to note that an entire morning of the Health Committee sessions was devoted to reports by Surgeon General Cumming and the writer on the survey and appraisal methods used for the stimulation of public health procedure in the United States and on the work of the recently organized Committee on the Cost of Medical Care.

The Health Committee voted that an account of the survey method and of the studies of the Committee on the Cost of Medical Care should be included in the publications of the Health Organization, and the medical director was invited to prepare a report on methods employed for the appraisal of public health activity and, in collaboration with the school of hygiene and health administration interested, to collect and analyze information concerning the work of health centers and other similar activities in Europe.

Reports were presented of the commissions engaged in preparing for the forthcoming revision of the *International List of Causes of Death* (in which Haven Emerson, M.D., has played a prominent part). The schedule which will be presented for consideration at the final meeting next fall includes a full list of 155 titles, an abridged list of 86 titles and a third still shorter list which may be adopted by various governments as alternatives.

The Cancer Commission presented a particularly valuable report of a comparative study made by the institutes of radiology in Stockholm and in Paris, and the Women's Clinic at Munich in regard to the radium treatment of uterine cancer. The comparison of different methods adopted by these three institutes has proved of great value, and the results obtained are distinctly encouraging.

A commission on child welfare made a preliminary report summarizing in-

tensive studies on over 5,000 infant deaths and over 2,000 stillbirths in selected districts in Austria, France, Germany, Great Britain, the Netherlands and Norway, and similar studies are now under way in certain South American countries. The European districts covered vary from a district in Norway with an infant mortality rate of 35 to one in Austria with an infant mortality rate of over 200, and a comparison of the causes of death in relation to social, economic, and medical factors in these various districts promises to prove most illuminating.

The most important matter which came before the Health Committee is the program for reorganization of the health service of Greece. The Greek government a year ago invited the Health Organization to prepare a comprehensive program of health administration, and during the past winter and spring an exhaustive survey has been made in which Dr. Haven Emerson and Dr. Allan J. McLaughlin took part. On the basis of this study a program has been prepared for the development of a school of hygiene, and technical services of malaria control and sanitary engineering, and for the gradual development during the next five years of full-time health services ultimately covering the entire country. In each prefecture there will be a health center equipped with health visitors and sanitary assistants grouped about larger centers for laboratory and technical service. Detailed plans have been prepared for the training of personnel, and salaries and conditions of appointment will be such as to make the staff of the new service a *corps d'élite*. The program has the heartiest backing of M. Venizelos, and steps will be taken to put it into force in the immediate future.

NEWS FROM THE FIELD

SCHOLARSHIP IN UNIVERSITY OF MISSOURI

THE Woman's Auxiliary to the Missouri State Medical Association, at its recent meeting, May 14, 1929, founded a scholarship to be awarded to the student graduating from the School of Medicine of the University of Missouri who is deemed most worthy on account of scholarship, character, and financial necessity. The scholarship will carry $500 annually, and will be awarded for two consecutive years to the same student.

No particular line of work has been prescribed for those students to whom the award is made, though the fundamental object is the promotion of public health work, and it is hoped that those obtaining the scholarship will interest themselves in this specialty.

MASSACHUSETTS GENERAL HOSPITAL TO CUT MEDICAL COSTS

THE medical staff and trustees of the Massachusetts General Hospital have agreed on a plan whereby hospital charges and medical fees will be set at rates well below those now paid by patients in the private rooms, and yet sufficient to cover the cost of hospital care and compensate the physicians and surgeons. This will almost cut in half the usual bill for hospital sickness of a middle class patient.

Dr. Michael M. Davis, the Director of Medical Services of the hospital, says:

> . . . At present a 2-weeks' stay of a patient in the private pavilion of the Massachusetts General Hospital with a surgeon's fee would usually cost $250 or more. . . . If a patient stayed the same period in a ward bed and paid the full ward rate, it would cost him only about $60 and the doctor's work would

be done as charity. The large majority of Americans do not want charity, yet they are unable to pay the usual high charges for private rooms and private physicians. The Massachusetts General Hospital Plan fills the gap.

This new plan will be executed in the Baker Memorial Building, a special section of the hospital, now under construction. It will have 300 beds. There will be private rooms and provisions for 2 or 4 patients in the larger rooms. Rates, including all nursing service, will be from $4 to $6.50 per day.

ROCKEFELLER FOUNDATION RECORD

SINCE May 22, 1913, the Rockefeller Foundation has paid out from income and principal a total of $144,189,400. Most of this has been spent on the training of doctors, health officers, and nurses, the creation or strengthening of institutions of medical or public health education, building up of official health organizations, promotion of field research and the demonstration of new methods.

Temporary anti-hookworm campaigns in the United States and in many other countries have been broadened into permanent official rural health organizations. Malaria has been studied more fully and methods of control worked out at home and abroad. Yellow fever has been forced to retreat from Mexico and Central America and from Northern South America, until it is now found only in Brazil and West Africa. A wartime anti-tuberculosis organization built up with Foundation aid in France has been wholly taken over by the French and is being incorporated into a general public health service.

The sum of $29,000,000 has been spent for the creation of various schools and institutes of public health; for the strengthening of medical schools in many parts of the world from London to Singapore. This does not include the building, equipment and support of the Peking Union Medical College, and aid to hospitals and the premedical sciences in China.

Up to December 31, 1928, 3,187 fellowships have been granted, to representatives of 58 countries. The international significance of these may be inferred from the fact that 1,383 of these fellows pursued their studies in countries other than their own.

SHOCK-PROOF X-RAY APPARATUS

A NEW type of x-ray apparatus, which is completely insulated in oil and with all high-voltage wires completely eliminated, has been announced by the Victor X-Ray Corporation, with the installation of the first of these machines in the Neurological Institute, New York, N. Y.

Virtually any part of a patient's body may be x-rayed from any angle without moving the patient. Manipulation of the device to the patient's position replaces the shifting of the patient's position to suit the needs of the device. Such manipulation is invaluable when x-raying badly injured persons.

STATE WIDE X-RAY FILM PROBE IN NEW YORK

ACTING Governor Lehman has appointed a committee to investigate the use of x-ray films in New York State institutions, hospitals, laboratories and clinics. Matthias Nicoll, Jr., M.D., State Health Commissioner, has been named as Chairman of the Committee.

CAMPAIGNS

THE most important and far-reaching campaign ahead is the Summer Round-Up of the Children, a health activity of the National Congress of Parents and Teachers, 5517 Germantown Ave., Philadelphia, Pa. More than 2,500 parent-teacher associations in 44 states participated in the 1928 "round-up." The plan of work is simple and workable. The "physical inspection form" was compiled by representatives of the American Medical Association and the American Child Health Association. An opportunity to coöperate with and utilize local parent-teacher associations!

"SEEING THROUGH LIFE"

THE recently released annual report of the National Society for the Prevention of Blindness presents in review pictorially, diagrammatically, schematically in word pictures and with figures the accomplishments for the year 1928. For the information of its supporters and those concerned with prevention, enough of a comprehensive picture is given to whet the appetite of the reader and convince him of the worthwhile work accomplished. Three cents in postage to the National Society for the Prevention of Blindness at 370 Seventh Avenue, New York, N. Y., will bring anyone a copy of this report who wishes to study this attractive method of presentation.

HEALTH EDUCATION CONFERENCE

THE American Child Health Association conducted a Health Education Conference at Sayville, Long Island, N. Y., June 17–21, at which contributions were received from all of the school departments which belong in a comprehensive school health program: the Elementary School, Secondary School and Teacher Training Sections. Curriculum Building and Integration was the main topic of the whole conference and each section devoted two meetings to Materials and Activities, one to Health Service and one to Problems of Organization.

Dr. John Sundwall of the University of Michigan, Fellow, A. P. H. A., was Chairman of the General Sessions and Dr. W. F. Walker, Field Director of the Committee on Administrative Practice of the A. P. H. A., represented this Association.

NEW PUBLIC HEALTH AGENCIES

PRESIDENT Portes Gil has ordered the establishment of two new branches of the Mexican Department of Public Health: an office of sanitary exchange and a service of industrial hygiene and social prevision. The first of these departments will have charge of collecting foreign data on public health, publishing Mexican accomplishments in that field, insuring observance of obligations assumed by Mexico in international conventions concerning public health with reference to reports and notices, and keeping informed as to international congresses of health and hygiene while furnishing the necessary material and documents to Mexican delegates to such congresses. The second department has been created to watch over the sanitary conditions in places of work and the home conditions of the laborers.

PERSONALS

DR. WILLIAM H. WELCH, President of the Maryland State Board of Health, has resigned this position. He is the Director Emeritus of the Johns Hopkins School of Hygiene and Public Health, and the duties in connection with this position are enough to keep him occupied full time.

DR. THOMAS S. CULLEN, of Baltimore, was appointed by Governor Ritchie to succeed Dr. William H. Welch on the Maryland State Board of Health.

DR. W. W. FENTON has been appointed City Health Officer of San Bernardino, Calif., to succeed Dr. Ivan Lewis Finkelberg.

DR. ELMER H. BEST has been elected Health Commissioner of Freeport, Ill.

DR. GEORGE A. BARNETT has been appointed Health Officer of Riverside, Ill.

DR. JOSEPH G. BOSLEY has been reelected Health Officer of Madison County, Ky.

DR. HENRY ALBERT has been reappointed State Commissioner of Health of Iowa.

DR. THOMAS J. GLASSCOCK has been elected President of the North Dakota Health Officers Association.

DR. GEORGE D. HEATH, JR., has been appointed Health Commissioner of Florence, S. C., succeeding the late Dr. Percy H. Brigham.

DR. JAMES G. BLACK has been chosen Health Officer of Rutherford County, Tenn., succeeding Dr. Harry S. Mustard, resigned.

DR. W. F. WALKER, Field Director of the Committee on Administrative Practice, addressed the American Legion at Racine, Wis., June 6, on the Preschool Round-up. At the Annual Conference of Health Officers and Public Health Nurses at Saratoga Springs, N. Y., June 25–27, 1929, Dr. Walker gave an address on the Appraisal of Nursing Service.

CONFERENCES

July 8–12, American Medical Association, Portland, Ore.

July 9, American Heart Association, Portland, Ore.

Sept. 26–28, Association of Military Surgeons of the United States, Denver, Colo.

Sept. 30–Oct. 5, American Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, American Child Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, International Society of Medical Health Officers, Minneapolis, Minn.

Sept. 30–Oct. 5, American Association of School Physicians, Minneapolis, Minn.

Sept. 30–Oct. 5, Northwest Conference of Child Health and Parent Education, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Sanitary Conference, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Organization for Public Health Nursing, Minneapolis, Minn.

Sept. 30–Oct. 5, American Social Hygiene Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Conference of State Laboratory Directors, Minneapolis, Minn.

Sept. 30–week, National Safety Council, Chicago, Ill.

FOREIGN

July 25–Aug. 4, World Federation of Education Associations, Geneva, Switzerland

Aug. 8–21, World Conference on New Education, Elsinore, Denmark

Aug. 22–29, Adult Education Conference, Cambridge, England

Oct. 16, International Conference for the Revision of International Classification of Causes of Sickness and Death, Paris, France

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The Factor of Chance in Diphtheria Mortality

WALTER W. LEE, M. D.

Assistant Secretary, State Board of Health, Indianapolis, Ind.

THE present decade is the beginning of a new era in public health as far as diphtheria is concerned. Although the method of active immunization against diphtheria was discovered in 1912 it was not until 1922 that it was done on a scale of sufficient magnitude to influence the mortality rates. At that time the death rates from this disease were about 20 per 100,000 population. By 1925 the rate had steadily fallen to around 6. In 1927 throughout the United States and Canada the rates have tended to increase, averaging around 8. In the meantime 6 cities of over 100,000 population have reduced rates to close to zero and several smaller cities and counties have done likewise. There is scarcely a city or hamlet on this continent that has not used diphtheria immunization to some extent and yet the disease, after reaching its low level two years ago, is increasing.

Has diphtheria immunization failed to check diphtheria? Is the increase in the death rates real or apparent?

Immunization with either toxin-antitoxin or toxoid will prevent diphtheria in exact proportion to the extent of its use in the population under 10 years of age. This has been demonstrated in several cities of the United States and Canada. The greatest amount of immunization work has been done among school children, but very little has been done among the preschool population. In so far as the latter group has been neglected, the results have failed to lower significantly the general diphtheria mortality rates.

If we wish to estimate the significance of the present rise in the diphtheria death rate we must base our judgment on past experience.

The reliability of our final judgment must be proportional to the amount of reliable data on which it is based. Data for 10 or even 20 years are not enough for our purpose, especially when we have reliable data for 50 years available. Data for three communities are submitted here as samples of a large series, each one representing, in a general way, a different class.

The data have been plotted as the logarithms of the diphtheria death rates on plain cross-section paper. The slope of the trends has been determined by inspection. The positions of the trends have been adjusted so that the sum of the deviations of the rates from the trends in each instance is zero. The Standard Deviation (S. D.) is a measure of the annual fluctuation of the rates above and below the trend and is the square root of the average square of the deviations of the rates above and below the trend. Parallel lines are drawn above and below the trend line at distances of the S. D. and 2 S. D.

According to the laws of chance, frequencies in a series of chance events will distribute themselves about their mean or trend in such a manner that 66 per cent will fall within the range of the S. D. plus or minus, 95 per cent within the range of 2 S. D. with 5 per cent beyond. The 2 S. D. lines indicate the range, within which the rates may fluctuate from year to year, due to the influence of chance alone.

The accompanying graphs show that diphtheria death rates scatter about their trend in a manner similar to what would be expected were their distribution governed solely by chance. But other factors than chance operate in diphtheria. Contact between cases or carriers and susceptible individuals influences the prevalence of the disease. Natural active immunization of the population following an epidemic probably tends to cause the disease to progress in waves, with intervals of 10 years, more or less, between the peaks, as shown in Figure II. The trends in all three graphs are equal in slope, and in Figures I and III have continued in the same general slope for over 50 years. Note that the general average death rates represented by the trends are lower in New Haven than in Massachusetts, and those of Toronto are the highest. The average for each series as calculated from the trends for 1895 and 1928 are as follows:

	NEW HAVEN	MASSACHUSETTS	TORONTO
1895	39.0	50.0	77.5
1928	5.9	8.6	13.2

Diphtheria in New Haven has always been relatively low and in Toronto relatively high. Just what factor or factors have operated to cause this variation in death rates in the various communities, or the general depression of the death rates, is matter for speculation.

Diminished virulence of the causative agent, increased resistance of the population, increased use of antitoxin, quarantine and isolation of cases and carriers, with other factors, known and unknown, probably have had a part in the general reduction. After studying the course of this disease over a long period of years and in different situations, one cannot but be impressed by the predominance of the factor of chance in influencing the distribution of mortality.

Observe the data for Massachusetts—Antitoxin was introduced in 1895, and by 1898 the death rate dropped over 60 per cent. At that time there was reason to believe that the use of antitoxin had caused this change. The deviation is nearly 3 S. D. below the trend, and if only the data from 1875 to 1898 had been studied the deviation would have been still greater, probably 4 S. D. Such a drop might occur by chance, two or three times in 1,000 years. Had this experience been repeated in 1899 it would have been significant; but instead, the next year the rate was back at about its previous level. This transient drop was undoubtedly a chance phenomenon. A great part of the depression disappears if the data are calculated on the basis of the epidemiological year, September 1 to August 31, as indicated by the dotted curve in the graph. In 1926 the rate dropped again below the range of 2 S. D., returning to within this range in 1927. This drop is not significantly altered when the data are based on the epidemiological year. Such a drop beyond 2 S. D. is expected in a chance series about five times in 100 years, therefore, is not statistically significant. A certain amount of toxin-antitoxin has been used in the state in the last few years and may have had an influence in this drop; but whether or not this is true, the fall in the rate was insufficient to be considered significant, and may have been a purely chance occurrence. On the basis of the experience of Massachusetts since 1875, the expected average rate for 1928 is 8.6, with a possible deviation from that average to anything between 6 and 13, due entirely to chance, and neither extreme could be considered good or bad. The 1928 rate was again slightly below the 2 S. D. line and the rates for the next few years will show how significant is the reduction in the rates since 1925.

Figure IA shows the data for Massachusetts plotted on plain cross-section paper as numbers. This is the ordinary graph with which everyone is familiar. The lines representing the trend and S. D. and 2 S. D. are transposed from the logarithmic graph, converted into numbers and plotted arithmetically. Note that the space between the lines representing + S. D. and + 2 S. D. is wider than that between — S. D. and — 2 S. D. If we measure the spaces and compare them with the data their relative positions represent, we find that

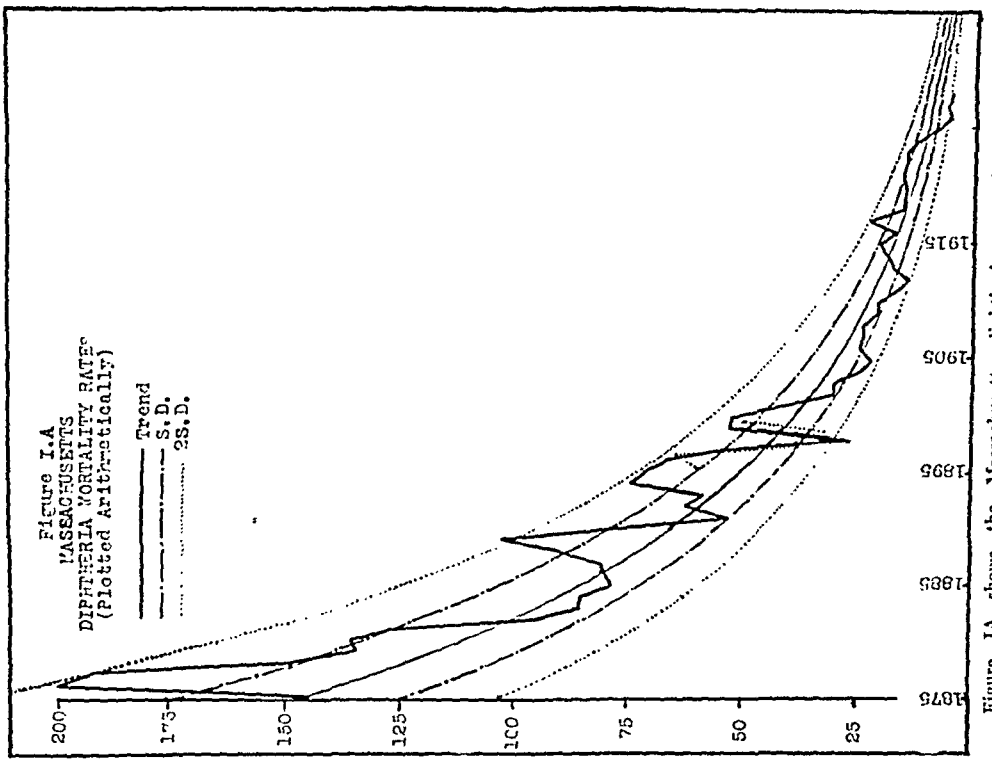


Figure IA shows the Massachusetts diphtheria mortality rates plotted arithmetically.

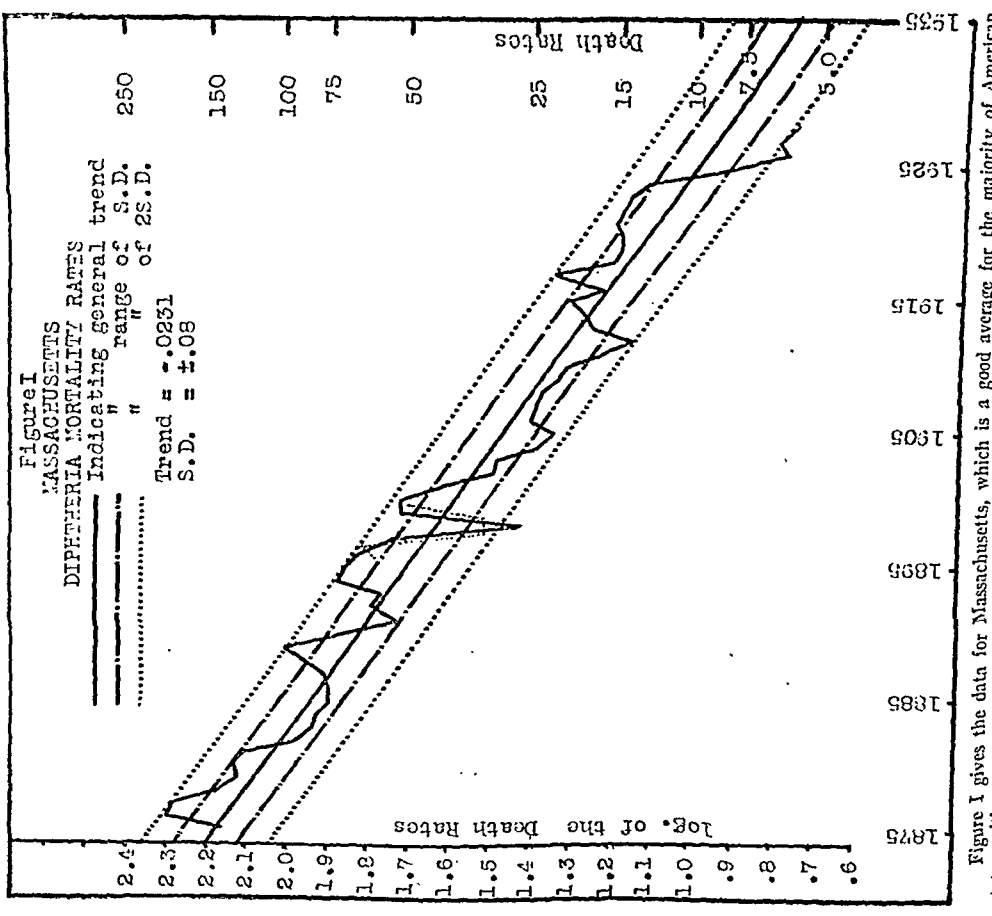


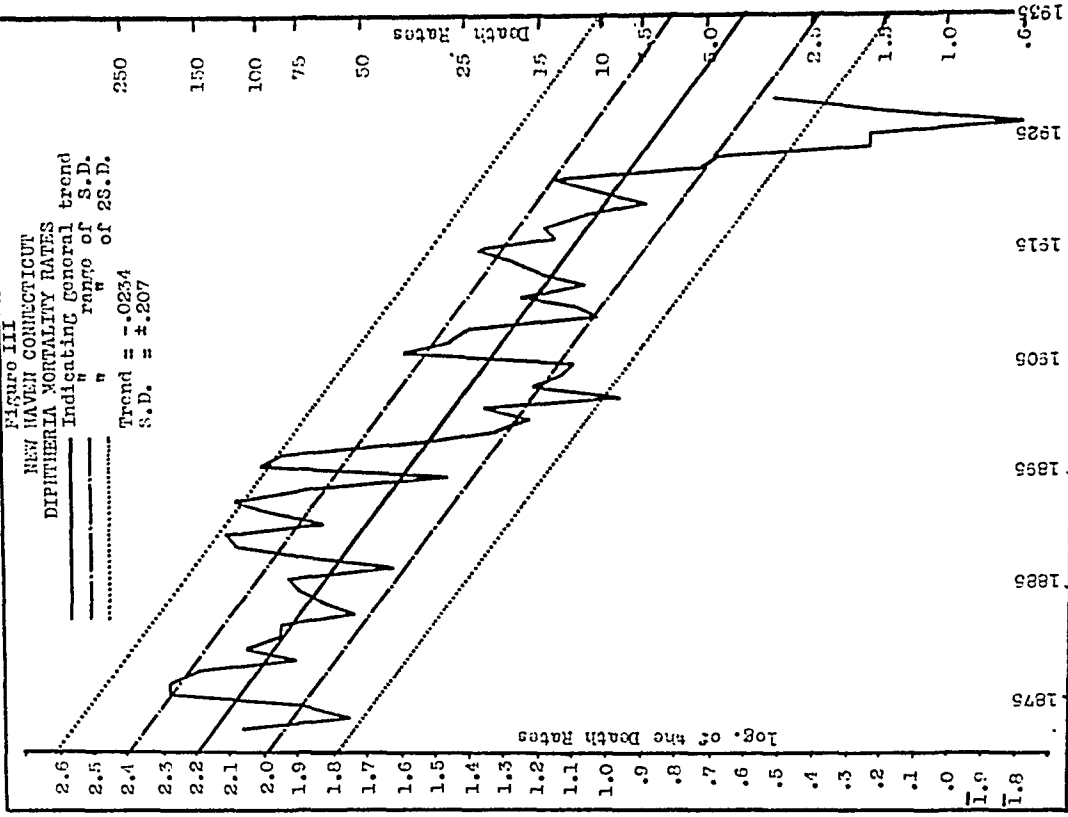
Figure I gives the data for Massachusetts, which is a good average for the majority of American states, with an average diphtheria mortality rate of about 8.5.

the ratios are equal. Note also that the lines representing the trend $\pm$ S. D. and $\pm$ 2 S. D. starting at 1935 and looking backward, diverge fanwise. This is due to the change in the magnitude of the data.

Note that in the arithmetic graph the data prior to 1900 are very unstable, while those since 1900 fluctuate only slightly. Compare this with the logarithmic graph and it will be seen that there the data fluctuate equally all the way. This difference in the fluctuations is apparent only, due to the change in the magnitude of the data. Although the actual fluctuations are greater, they all bear the same ratio to the general trend all the way along. Note also that practically all the data fall within the $\pm$ 2 S. D. lines as in the logarithmic graph.

Observe the Toronto data, Figure II. The population of Massachusetts is six times that of Toronto and the log. of the S. D. for Toronto data is exactly twice that for Massachusetts, due to the difference in population. If chance alone were operating, one could say that in 1928 the chances would be two to one that Toronto would have a diphtheria death rate between 20 and 9, and a chance of nearly one to two that it would be between 20 and 29, or between 9 and 6.3 with one chance in twenty of the rate exceeding either of the extremes. In 1928, the rate dropped to 8.2. It is impossible to estimate the influence of the immunization of 21,000 children in 1927 in this reduction. It was no doubt a factor, but greater reductions have occurred in the past without the aid of immunization and the reduction is well within the range of chance fluctuation. We must wait a few more years before we will see significant effects of immunization in Toronto.

Next consider the graph for New Haven, Conn. In calculating the S. D., the years 1924–1928 were not included, for these data have obviously been influenced by another factor not operating the previous years. The population is about one-third that of Toronto and consequently the S. D. is greater. In 50 years prior to 1924 the death rates deviated three times from the general trend by slightly more than 2 S. D., which is statistically insignificant. In 1924 the death rate dropped below the trend line a distance of 3 S. D., an event that might have occurred by pure chance about once in 500 years. In 1925 the rate was the same, and might have occurred likewise by chance once in 250,000 years. Then in 1926 the rate exceeded 5 S. D. and in 1927 nearly 3 S. D. again. It is therefore obvious that a new and potent factor was at work in New Haven beside that of chance. As a matter of fact, since 1923, New Haven has, among other public health activities, immunized about one-half its susceptible children against diphtheria and the result is exactly what one would expect. If in 1925 the death rate had been 2.7 or more, instead of 1.7, the drop of 1924 would have



In Figure III the data for New Haven, Conn., are given and are similar to those of Hamilton, Can., Auburn and Syracuse, N. Y., Cambridge, Mass., and St. Paul, Minn. This graph represents cities in which intensive diphtheria immunization has been done and in which the death rate has subsequently fallen.

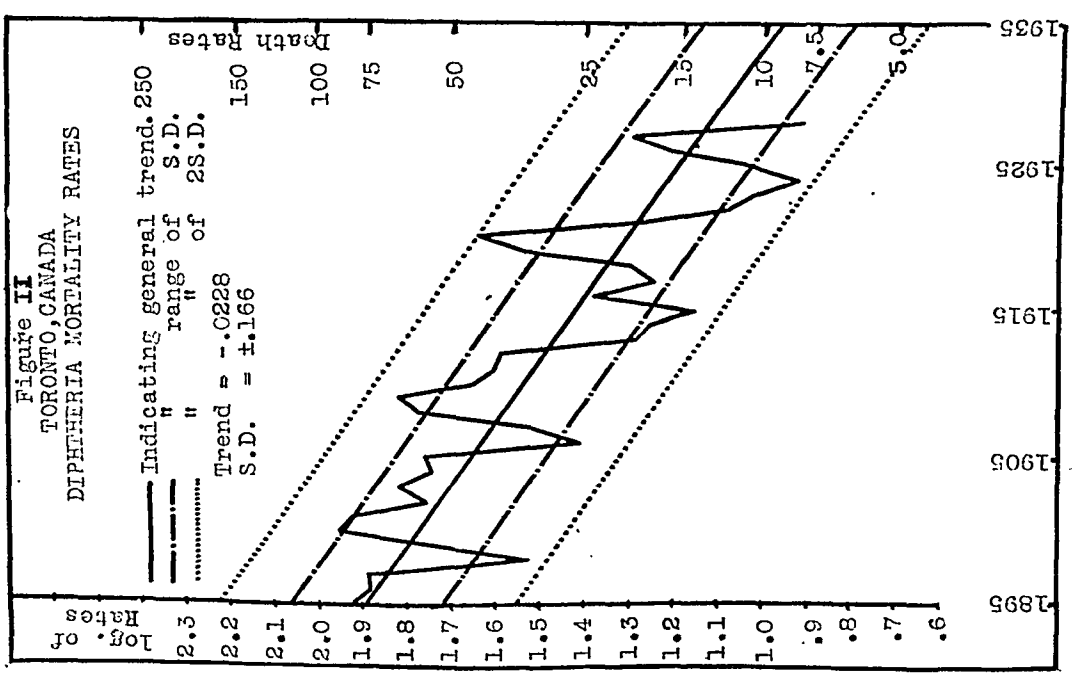


Figure II shows the data for Toronto, Can., which are similar to those of Detroit, Mich., Cleveland, O., and other cities, and represent a group with a relatively high diphtheria mortality rate of around 13.

been of doubtful significance, especially if, following 1925, the rate had continued between 2.7 and 6.3 as would have been expected had toxin-antitoxin not been used. As it is now, irrespective of what may happen in the future, the data show that some factor has operated to reduce New Haven's diphtheria death rate, and we have reason to believe that the factor is toxin-antitoxin immunization of one-half the child population.

Diphtheria mortality rates in Indiana, calculated on the basis of the epidemiological year, fell from 24.1 in 1921 to 5.4 in 1926, but in 1927 and 1928 the rates were 6.8. Indiana data go back to 1900 only, hardly sufficient time to draw definite conclusions, but what data we have, when compared with the older data of other states, show that the extremes of 1921 and 1926 are within the range of chance distribution. On the basis of 28 years' experience, the expected average for the coming year is about 7 with a range of fluctuation due to chance alone of anything between 4 and 13.

When chance is a factor of such great importance in the distribution of our death rates, it seems to be a waste of energy to worry over a fluctuation of one to five units in a death rate, provided always that the scattering of the rates, as measured by the S. D. of the data under consideration, is not of sufficient magnitude to disturb significantly the general trend of the series.

As far as the writer has observed, only 8 cities in Canada and the United States have to date immunized a sufficiently large proportion of their population under 10 years of age, so that their diphtheria death rates have dropped below 2 S. D. of their data. In cities under 100,000 population the data are so unstable due to the size of the population that, with the average expected death rate around 10, the S. D. is so large that a reduction of the death rate even to zero can hardly be statistically significant unless the favorable rates are repeated as they were in Auburn, N. Y., 1925–1927, when the rate remained at zero for the 3 years in succession.

In many of our great cities, immunization has been carried on for years in the schools, yet their diphtheria death rates continue on within the normal range of the general trend, due no doubt to the fact that a large percentage of the immunization work has been done among children of the older age groups.

Diphtheria immunization is an undertaking of great magnitude and wonderful possibilities, and requires intensive work concentrated on the 0–10 year age group. According to the experience of the cities where this has been done the death rate will not be lowered significantly, so that it will drop more than 2 S. D. below the general trend

for the city, until about one-half the child population has been immunized.

The S. D. is a yardstick which is invaluable to health officers as a means of measuring statistically the results of work done in a community. By means of such measurement, one can avoid the error of attributing to health activities events that are due to pure chance and good luck. It likewise affords us a measure whereby we may estimate the significance of the deviation of our death rates from the general trend, thereby apportioning to each datum its true value in relation to past experience and future probability.

SUMMARY

1. Beginning in 1922 diphtheria mortality rates have tended to fall, reaching a minimum in 1925–1926, since which time they have shown a tendency to increase from one to three units. This increase is entirely insignificant, and is what we would expect merely from the operation of pure chance, as is shown by the graphs for Massachusetts, Toronto and New Haven. These data show that rates may scatter from three to ten units above or below the average rate, depending on the size of the population involved, without significantly disturbing the general trend of the death rates.

2. Although a considerable amount of diphtheria immunization has been done in every city, there are only a few cases where enough has been done to lower the death rates significantly.

3. In cities where diphtheria deaths have been significantly lowered, it was accomplished only after about one-half of the susceptible population under 10 years of age had been immunized.

4. If we wish to judge the relative value of recent data or project our estimate into the future, the value of our judgment will be proportional to our knowledge of past experience. As an efficient aid in such calculations, the trend of the data is a stable and reliable landmark from which to work, and the Standard Deviation is a yardstick readily obtained.

Your Vacation.

THE sheltered life we lead during the greater part of the year is contrasted with the usual rough and tumble of the summer holiday in an attractive leaflet published by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Mass. The pitfalls awaiting the unwary tourist and camper are stressed, and suggestions for sensible summer behavior include advice about the selection of drinking water and milk supplies, exposure of the body to sun, overexercise and health examinations. This brief, pointed illustrated leaflet of 6 paragraphs will be supplied free to health agencies in quantities sufficient to meet their needs.

International Health*

FRANK G. BOUDREAU, M. D., C. M.

Health Section, League of Nations, Geneva, Switzerland

ORGANIZED international collaboration in hygiene is no longer a matter of experiment, but is, after some 7 years of trial, an accepted fact. It is perhaps not too much to say that the public health services of the various governments have come to realize the value of the facilities offered at Geneva for fruitful collaboration in the study and prevention of disease; and the use of these facilities has become in many cases a matter of routine. I should like to emphasize the need for such collaboration, and to attempt to show that the international health work of which I speak is only one of the activities of an organization created by a large majority of the countries of the world, and now maintained for the purpose of organizing their external relationships in the increasingly complicated world in which we live.

The need for international health work was felt long before any international health organization existed. About the middle of the 19th century the improvement in communication and transportation and the growth of industry and commerce, which had the effect of lessening the effective size of the world and of decreasing the economic independence of the various countries, created an unprecedented network of international relationships which obviously required organization if even a semblance of order were to obtain. Problems arose which required for solution the common action of a number of countries. When a problem became particularly acute a government took upon itself the responsibility of calling an international conference, and during the last half of the 19th century such conferences became more and more numerous. These pioneer attempts to solve problems arising in the international field were not always crowned with success, and the experience with the international sanitary conferences illustrates the difficulties and disappointments involved.

The first international sanitary conference was called by the French Government in 1851, in order to secure agreement in matters of maritime quarantine and to obtain united action in the prevention of cholera and plague. It was hoped that the issue of such a con-

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* Presented at a General Session of the American Public Health Association, at the Fifty-seventh Annual Meeting at Chicago, Ill., October 17, 1928.

ference would be a convention or agreement among the participating countries prepared by the conference, signed by the delegates, and later ratified by a sufficient number of governments to bring it into effect.

A number of such conventions or draft agreements were prepared by the 20 sanitary conferences held during the last half of the 19th century; but it was not until 1893, 42 years after the first one was held, that a sufficient number of governments ratified a sanitary convention to make of it an effective instrument of international intercourse. In considering the progress of international health work today difficulties such as these obtaining so recently must be borne in mind.

While international sanitary conferences were being held, the governments were attempting to solve problems in other fields by the same means. Thus, postal affairs came up for consideration by international conferences, and this important matter was solved by the creation of a Universal Postal Union in 1878. Those who may be interested in the organization of international relationships should read the brochure on this subject written by Prof. John F. Sly.[1]

The growth of commerce and industry forced other problems on the attention of governments, so that international conferences were called to deal with such problems as universal standards of weights and measures, the gauge of railroad tracks, customs declarations, telegraphic communication and others which new world conditions had made of interest to many instead of to only one or two countries.

Experience showed that if international conferences were to achieve their object of securing general agreement, they must be well prepared, the views of the various governments being ascertained and exchanged beforehand; they must be properly conducted with adequate provision for interpretation and secretarial work; and some neutral agency must make a business of following up the matter so that the convention or agreement secured would not become a dead letter.

These desiderata were obtained in the case of postal affairs and weights and measures by the creation of international organizations with permanent secretariats, which have been called little Leagues of Nations, established for the purpose of organizing international relationships in a particular field, and providing machinery for the continuous collaboration of the governments in respect of that problem.

International sanitary conferences which met at intervals of from 4 to 6 years after 1851 emphasized the need for a permanent international health organization; but it was not until 1907 that such an

organization was agreed upon at an international conference held in Rome.

CREATION OF OFFICE INTERNATIONAL D'HYGIENE PUBLIQUE

The organization, known as the Office international d'Hygiène publique (International Public Health Office) began to function, with headquarters in Paris, in 1908 and since then has had a continuous and useful existence.

It consists of a standing committee meeting twice a year at Paris, and a small permanent secretarial staff, including a director and the necessary clerical assistance. The committee is composed of representatives of the public health administrations of those governments which have ratified the Rome arrangement (some 45 at present) and as these representatives are briefed by their governments they sit on the committee as government representatives.

The Office international d'Hygiène publique was the agency entrusted with the application of the international sanitary convention, which was redrafted in 1912 at a conference held in Paris, and again redrafted in 1926 at another conference called for the purpose by the French Government.

In the meantime the World War had seriously interfered with all organized international intercourse, while creating a situation in which international problems had become more numerous and acute. It was in these conditions that the Health Organization of the League of Nations was created.

PLAN OF THE HEALTH ORGANIZATION OF THE LEAGUE OF NATIONS

It is needless to describe the steps leading to the establishment of the present Health Organization. Nevertheless, I must insist on the importance of certain features of that organization in order to show the difference between present and pre-war conditions, and to permit you to judge how well the present facilities for international collaboration in hygiene measure up to the existing needs and opportunities.

The present Health Organization of the League consists of three parts:

Advisory Council
Health Committee
Permanent Secretariat

Advisory Council—The Advisory Council is constituted by the Standing Committee of the Office international d'Hygiène publique, previously referred to. This committee, composed as it is of delegates from the public health services of some 45 governments, is well fitted

to act as an advisory council and to speak for the health administrations of the world on any policy or activity relating to international health. It receives all reports of the Health Committee, which may refer to it any matter in which its advice or opinion may be desirable. While this committee thus serves as an advisory body for the Health Organization of the League of Nations, the fact that it is a separate and independent international organization must not be forgotten.

Health Committee—The Health Committee of the League is a body of experts in hygiene set up to advise the Assembly and Council of the League on matters relating to international health. There are 24 members (3 from the United States). This committee meets twice a year, usually at Geneva, and all its resolutions must be approved by the Council of the League before they are acted upon.

There are two fundamental differences between the Health Committee of the League and the Standing Committee of the Office international d'Hygiène publique:

1. The members of the Health Committee do not sit on that committee as delegates of their governments. They are simply selected as health experts in their capacity as individuals, which explains the presence of members from countries which have not adhered to the Covenant of the League of Nations.
2. The Health Committee is a part of a much larger international organization, and its work is bound up with that of other organs of the League.

Permanent Secretariat—The Health Section is a part of the General Secretariat of the League of Nations, a body of permanent officials which has been likened to an international civil service. It consists of some 15 physicians of various nationalities and the necessary clerical assistance. The majority of the Health Section is to be found at Geneva, the seat of the League of Nations, but it has another important seat at Singapore.

RELATIONS OF HEALTH ORGANIZATION WITH OTHER LEAGUE ORGANS

The League of Nations itself consists of an Assembly, a Council, and a General Secretariat. The Assembly is made up of 3 delegates from each State Member, and these meet regularly in Geneva every September for a period of from 3 to 4 weeks. Press accounts of the Assembly emphasize the plenary sessions and the general debate, frequently on political questions, but the work of the committees into which it is divided is not frequently mentioned; yet these 6 committees carry on some of the most important work that is done in Geneva. Two of these committees are concerned with the work of the Health Organization—the Second and Fourth.

The Second Committee of the Assembly reviews the work of the

technical organizations of the League, of which there are three, Health, Financial and Economic, Communications and Transit. Reports on the work of the Health Organization during the past 12 months are received by the Second Committee; there is a general debate on the subject, and a rapporteur is appointed who prepares a report for submission to the Assembly summarizing the debate and ending in a resolution of approval. During the debate there may be criticism, approbation, and proposals for new work. During the last session of the Assembly, for instance, delegates from Australia, Japan, Spain, Poland, India, Italy and Holland spoke in warm terms of the value of the Health Organization's work, and Mr. O'Sullivan, Minister of Public Instruction in the Government of the Irish Free State, prepared a report which was presented to a plenary session of the Assembly and approved. You will therefore appreciate that the Health Organization of the League possesses an important relationship with the Assembly itself, so that international health problems are discussed not only in Assembly Committees but also in plenary sessions.

The Fourth Committee of the Assembly considers the budget of the Health Organization. This year the budget for 1929 was approved as presented to that committee.

The Council of the League, which usually meets four times yearly, and consists of 9 temporary and 5 permanent members, must approve resolutions adopted by the Health Committee before they become effective. One of the members of the Council is appointed rapporteur on health, and it becomes his duty to prepare a report for the Council's consideration. For several years the distinguished delegate from Japan has acted in this capacity. This year the rapporteur on health is the delegate from Spain. The Council may refer any health problem to the Health Committee for advice and this has been done not infrequently in the past. The Assembly also frequently refers international health questions raised by the delegates to the Health Organization for advice or investigation.

The General Secretariat of the League, referred to above, is under the direction of a Secretary-General. It is divided into Sections, each with some particular preoccupation, such as health, finance, economics, disarmament, etc. As the Health Section is an integral part of the General Secretariat it is natural to presume that the relation of health questions to other international problems will be given due recognition.

The Health Organization has important relations with other organizations of the League. For instance, it is jointly concerned with the Financial and Economic Organization, in the settlement of Greek and Bulgarian refugees. The Greek Refugee Settlement Commission

and the similar Commission set up by the League to deal with the problem of Bulgarian refugees found that questions of health must be settled before progress could be made. In both cases malaria was prevalent and in addition tuberculosis was rife among the refugees in Greece. On the recommendation of the respective commissions, the Health Organization was consulted and is now collaborating actively with the public health services of both these countries in dealing with these problems.

The Health Organization of the League, like the League itself, is not so much an entity apart from the governments which form it as a method of facilitating the collaboration of those governments in the international field. Thus the very constitution of the Health Organization permits it to draw upon the most expert services available in the world to deal with any problem. Experts in the prevention of tuberculosis from various countries would gladly accept the invitation of the Health Organization to advise it in regard to the campaign in Greece, for instance, and the latter would have no hesitancy in calling for assistance from an organization in which she is a full partner.

The Health Organization has relations with that Section of the League dealing with Opium as well as Social and Humanitarian questions. It was called upon to define the maximum legitimate consumption of opium and cocaine for the International Conferences which drafted the opium convention now in effect.

The Mandates Commission, which reviews the annual reports of mandatory powers on their administration of mandated territories, refers to the Health Committee the chapters of these reports dealing with hygiene and public health.

The Organization for Communications and Transit is in frequent relationship with the Health Organization, as health questions and maritime quarantine seriously influence maritime traffic, and joint commissions have been set up by these two League organizations to deal with problems in which both are interested.

These are only a few of many examples which could be mentioned to show that the Health Organization derives much benefit from its position in a complete international organization, and, of course, the advantages are not altogether one-sided.

RELATIONS WITH THE "WINGS" OF THE LEAGUE

Two organizations, sometimes called wings of the League, to indicate that they have an independent existence, are the International Labour Office at Geneva and the Permanent Court of International Justice at the Hague.

The International Labour Office is an organization somewhat resembling the League itself, with an annual International Labour Conference instead of an Assembly, a Governing Body in place of the Council, and a General Secretariat in all respects similar to that of the League. It deals with questions affecting labour, and is therefore concerned with industrial hygiene. Necessarily certain aspects of industrial hygiene also interest the Health Organization of the League, and joint commissions representing the two organizations meet not infrequently to deal with such problems to the best advantage. Two such joint commissions are at present studying the preventive aspects of health insurance with a view to the improvement of the services and conservation of the resources available for the purposes of preventive medicine.

No question affecting the Health Organization of the League has so far come up before the Permanent Court of International Justice, but in case the Council of the League wished to ascertain whether the Health Organization was competent to deal with a particular problem, the Court might be asked for an opinion.

There is therefore a vast difference in the adequacy of the machinery for international collaboration available now and the more primitive forms elaborated in the pre-war period. At present machinery exists capable of dealing with almost any question affecting international relations, while before the little Leagues of Nations previously referred to were constituted, each to deal with one particular subject, no machinery existed for dealing with many others.

The Health Organization of the League as an organization is very young. Its possibilities have hardly been explored. In considering it we must not think of the small secretariat at Geneva, but rather of the great resources of the health administrations of the world, for the secretariat at Geneva exists simply as a means of facilitating the collaboration of those administrations.

WORK OF THE HEALTH ORGANIZATION

Of the developments the most important has been the establishment and organization of the Eastern Bureau at Singapore. I should like to call your attention to the fact that, alone among the organs of the League, the Health Organization possesses two technical bureaus, the one at Geneva and the other at Singapore.

Singapore has been well called the crossroads of epidemic disease, and here, the Health Administrations of the Far East recommended, would be the best place to establish a bureau of the League's Health Organization. Approval by the Health Committee and the Council

of the League was forthcoming promptly, and in March, 1925, the bureau began to function. The need for such a bureau had been demonstrated many years before, but in the international field something more than the demonstration of a need is required to provoke action. Before the League existed it required many weary years to secure international agreement in regard to such matters as quarantine, but when the bureau at Singapore was founded the League had already served its apprenticeship as a means of promoting and facilitating international action. In the case of this bureau, action followed recommendation as rapidly as could be expected.

The Japanese member of the Health Committee had in 1922 called the attention of the Committee to the epidemic situation in the Far East, and had recommended the dispatch of a mission to discover the amount and importance of the information available concerning the prevalence and control of epidemic diseases in the ports of the Far East. On the completion of the survey, a conference of the Far Eastern Health Administrations was convened, and as soon as it was ascertained that these administrations favored and would support such a bureau, the steps necessary for its establishment were taken, and the bureau began to function on March 1, 1925, receiving and transmitting information in regard to the important epidemic diseases in the ports of the Far East. During the first week this information related to 35 ports controlled by 12 administrations. Exactly 3 years later, the bureau was in weekly touch with nearly 140 ports, and now even this figure has been exceeded, while the scope of the information itself has been much increased.

The diseases concerned are cholera, plague, rat plague, smallpox, yellow fever, dysentery and any other prevalent or epidemic disease. The information is sent by cable to Singapore, immediately if it relates to a new outbreak, weekly if it has been prevailing.

All these cables pouring in from the Health Administrations which control the whole of the area bounded by the East Coast of Africa, Australia, New Zealand and the Pacific Islands, India, Japan, China and certain ports of Russia, are made into a coded message and broadcast by wireless on Thursday, Friday and Saturday of each week from 9 powerful broadcasting stations placed at the disposal of the Eastern Bureau by the governments to whom they belong. The message is still sent by cable to a few administrations which have not yet succeeded in picking up the wireless broadcasts regularly.

For the benefit of ships at sea, a number of less powerful broadcasting stations transmit the messages in clear so that the officers of

any ship equipped with wireless in Eastern waters may learn all that is known to the Health Administrations concerning the disease conditions in the ports at which she may touch. Information in regard to the movement of infected ships is also collected and distributed, and in 1927 the bureau notified the arrival of 165 ships infected with such diseases as smallpox, cholera, influenza, cerebrospinal meningitis, plague, and typhus.

The wireless message broadcast weekly by the bureau is supplemented by a weekly bulletin confirming the message and containing additional information of interest. The Health Administrations concerned send representatives to a yearly conference, known as the Advisory Council, in order to advise the Health Committee of the League on the conduct of the bureau. On the advice of the Advisory Council the work of the bureau has been extended beyond the limits first proposed. By means of its facilities the Health Administrations of the Far East are carrying on coördinated studies of plague, cholera, port quarantine, and the seasonal prevalence of epidemics.

While the Eastern Bureau of the League's Health Organization is a physical entity, it is also, like the League itself, a method of work, a means of giving effect to the desires of the Health Administrations concerned, for profitable international coöperation, an instrument for organizing and facilitating international relationships.

As you know, the Health Organization at Geneva collects and publishes epidemiological information from the world as a whole. Daily, weekly and monthly bulletins are distributed containing all the information received from the various countries. All the information received at Geneva, all the cables sent to Singapore, are the voluntary offerings of the Health Administrations concerned—no Health Administration is obliged by any international law or agreement to go to the trouble and expense of collecting and transmitting this information to Singapore or Geneva.

This will serve to emphasize the fact that the League has provided in the field of international health a means of giving practical expression to the desire, nay, to the need, of the various governments for collaboration in the prevention of disease.

INTERCHANGES OR STUDY TOURS OF PUBLIC HEALTH PERSONNEL

When the Health Organization of the League was first founded, its task was to promote the collaboration of the various governments which had pledged themselves by the terms of paragraph (f), Article 23, of the Covenant to " take steps in matters of international concern for the prevention and control of disease."

The international situation at that time was far from being as satisfactory as it is at present. Governments of countries lately at war were not readily disposed to collaborate. Yet there was great need for common action against epidemic diseases which were spreading from East to West and threatening to overwhelm the whole of Europe. Among the various methods of promoting international collaboration employed by the Health Organization of the League was the system of interchanges or study tours which has now become a permanent and fruitful activity. To clarify the subject let me describe an interchange which took place during the summer of 1928.

In view of the importance of rural hygiene it was decided to study this subject in several Eastern and Western European countries. Districts in each of these countries were visited by a member of the Health Section, and a detailed program of study prepared in collaboration with the Health Authorities concerned. The program included a review of the activities of every organization or agency having any influence on the health of the rural population.

An attempt was made to emphasize those features which were of particular interest in each country. For instance, practical public health education has attained a high development in the Kingdom of the Serbs, Croats and Slovenes; new and interesting schemes for sewage disposal in villages may be found in Hungary; health insurance has reached a high stage of development in Germany; in Holland, single water supplies for a number of villages have proved of great economic and hygienic value; the coöperative movement known as the Farmers' League in Belgium has not only raised the economic level of rural life, but is a potent force in public health education; while in some parts of rural France the health authorities have, by exceptional intelligence and ingenuity, applied a modern health program at a surprisingly low cost. These, it must be noted, are only a few of the many features of interest presented by each country.

After selecting the districts to be visited, competent health officers were requested to prepare booklets setting forth the main characteristics of rural hygiene, such as the organization, budgets, chief problems and activities of agencies other than the health organization which influence rural hygiene—in a word, descriptions intended to give to the visiting health officers as clear a picture as possible of all that makes up rural hygiene.

Sixteen public health officers and 7 sanitary engineers from 17 countries were invited to participate, and the booklets referred to were distributed in advance, so that each participant was in a position to profit from the tour. I had the pleasure of accompanying this

interchange from the beginning at Ljubljana on May 28, to the final conference held at Geneva on July 23, 24 and 25, 1928.

I am emphatically of the opinion that these interchanges furnish unique opportunities for the study of public health activity. No public health officer travelling alone for the same period can see anything like so complete a picture of public health organization and administration as is shown to the interchange group. Moreover, in the interchange on rural hygiene almost every phase of rural life was shown, so that the subject could be studied in its relation to the life and habits of the people. The great advantage of being able to examine at close range the varying activities of rural health departments in a number of countries differing sometimes widely in race, development, economic conditions and method of government, is too obvious to need emphasis. Also, the discussions which go on within the group are enlightening, for here the activities under consideration are seen from as many points of view as there are participants.

At the final conference in Geneva, nearly every participant stated that he had found something worthy of emulation in every one of the countries visited, and changes of importance in the health practice of a number of rural health departments will undoubtedly result. Health departments of countries in which interchanges have taken place have emphasized the benefit they themselves reap, partly as a result of the process of stock-taking necessary to present a clear description to the visitors, and partly as a result of the suggestions offered by the participants in the course of the informal and friendly discussions.

Since the system of interchanges was started in 1923, approximately 500 public health officers (including a few sanitary engineers and medical specialists) from 50 countries have participated, and approximately 40 countries have been visited. What have been the benefits?

I think no one would deny that these interchanges have fostered a splendid *esprit de corps* among the health services of the different countries. Perhaps this is the greatest benefit of all, and I am convinced that the cordial relationships established between health officials of different nationalities is of itself well worth the time and money spent for the purpose. But there are other and more practical advantages. There is the more general diffusion of knowledge concerning modern public health methods; there is more uniformity in public health practice, for the better methods are bound to be copied; and there is the accumulation of a common fund of knowledge as a result of friendly international comparison of experience and results. The

interchange is a powerful means of bringing about the reform of public health administration, and its results along this line have fully justified the expense involved.

POSTGRADUATE INSTRUCTION

Every public health officer needs to be reminded occasionally of the advances being made in the practice of preventive medicine. Postgraduate instruction in hygiene and public health is not sufficiently generalized to meet this need. And perhaps the system of interchanges fills this need more effectively than certain forms of postgraduate instruction, for in the interchange the participating health officer is enabled to witness the application of new public health methods in actual practice, where the results are most readily appreciated.

Variations of the interchange idea are the international courses in hygiene recently held in Paris and London and the malaria courses organized in London, Paris, Hamburg and Rome. These so-called continuation or "refresher" courses, organized by the Health Organization of the League in collaboration with the University of Paris and the British Ministry of Health, were an attempt to provide instruction to health officers on recent advances in the sciences underlying the practice of preventive medicine. The lecturers were selected from a number of countries, and were the individuals responsible for recent advances in our knowledge of such subjects as physiology, biometry, epidemiology, bacteriology, public health administration and sanitary engineering. The students were public health officers nominated by their administrations, and so popular were these courses that, at Paris, for example, nearly half of the group attended at their own expense or at the expense of the public health services to which they belonged.

The malaria courses are being organized for the fourth successive year. They are intended to afford, to public health officials charged with the campaign against malaria, theoretical and practical instruction in malaria control. The theoretical courses, lasting one month, are held at the institutes or schools of tropical hygiene in the several cities mentioned (at Rome in a school specially organized to teach malaria). The practical instruction, lasting 2 or 3 months, is given in Italy, Spain and Jugoslavia, where the student is enabled to assist in the campaign against malaria under the direction of experienced malariologists. These schools have enabled various governments to train staffs of malariologists in a short period of time, in order to deal with a pressing problem for which trained personnel had not been available.

Thus, by means of an international organization, the training facilities possessed by certain countries are being utilized by others not possessing these advantages.

It is hardly necessary to insist at greater length on the value of the system of interchanges. The Health Organization was enabled to organize this system through the generosity of the Rockefeller Foundation, which has continued its support for a number of years. The League itself makes a generous grant for this purpose, and successive Assemblies have insisted on the value and need for the extension of this activity.

STANDARDIZATION WORK

The need for common standards was early recognized by the American Public Health Association, which has achieved notable success in securing the adoption and extending the use of standard methods of water, milk and sewage analysis. Standard methods enable ready comparison, and uniform methods of recording results also facilitate international comparability. The setting up of international standards in respect to serums, biological preparations and serological reactions, has been a preoccupation of the Health Organization from the beginning, and although Dr. Madsen, the Chairman of the Health Committee, explained this work in detail at the Detroit session,* I must describe to you briefly the advances made since that time.

As a result of conferences convened by the Health Organization and of laboratory studies undertaken on its behalf by the leading public health laboratories of the world, agreement in regard to the units of a number of therapeutic serums such as diphtheria and tetanus antitoxins has been reached. This work was amplified during the past four years and now extends to anatoxin, anti-dysentery serum, scarlet fever toxin and serum, anti-gas-gangrene serums, tuberculin, standard serums for blood groups and the nomenclature of such blood groups. (I do not wish to imply that international units have been adopted for all these, but they are all being studied with that end in view.)

Furthermore a number of therapeutic substances requiring biological methods of testing have been studied with the object of international standardization. This group includes such substances as the salvarsans, digitalis, strophanthus, scilla, insulin, pituitary extract, thyroid preparations, ergot, filix mas and oil of chenopodium. This work requires considerable time, for stable preparations for reference purposes must be prepared. The responsibility for this work is usu-

* Madsen, Thorvald. Health Work of the League of Nations. Fifty-fourth Annual Meeting, American Public Health Association, Detroit, Mich., October 20, 1924.

ally entrusted to those individuals or laboratories which have had the greatest experience with the preparations in question.

Once a stable preparation is secured, the international unit adopted is expressed in terms of that preparation, and individual methods of testing are not as a rule interfered with. Samples of any of these preparations may be sent to the central laboratory for comparison with the stable preparation, and this work is done by a central laboratory selected on behalf of the Health Organization of the League, or samples of the stable preparation may be sent to the national laboratories desirous of making such comparisons. The Health Organization has no laboratory—all this work is done on its behalf by the various national laboratories, which again emphasizes the rôle of the Health Organization as a method of facilitating the collaboration of the different public health services.

The units adopted by the Permanent Standards Committee as a rule receive international recognition because they have been arrived at as a result of coördinated studies in the national institutes chiefly concerned, and no decision is made until agreement has been reached by the chiefs of the participating laboratories.

To members of the American Public Health Association it is hardly necessary to stress the desirability of such standardization work. It promotes better understanding among public health officials, the medical profession and laboratory workers; enables the value of improvements in methods of treatment to be appreciated more generally; and is a safeguard for countries where such preparations are not manufactured but must be imported from various sources. May it not be considered in the light of a common language, enabling technicians working with these preparations to understand more easily the communications of those having similar responsibilities in other countries?

INTERNATIONAL COMMISSION ON SLEEPING SICKNESS

During the last few years an interesting study of the etiology, epidemiology and prevention of sleeping sickness has been going on in Africa under the auspices of the Health Organization. A group of experts from the health services of England, Belgium, France, Germany, Portugal and Italy carried on for a period of 18 months a series of important field and laboratory investigations of this disease. The program was framed by an international conference of sleeping sickness experts convened by the Health Organization in London.

The Commission on Sleeping Sickness had headquarters at Entebbe on Lake Victoria in Uganda, and from this point its researches extended far into the field. The Commission was able to produce an

important volume on the epidemiology and prevention of sleeping sickness, and agreed on a number of administrative recommendations. This report and the recommendations are now being considered in Paris by an international conference of medical and administrative officers from the countries chiefly concerned.

I am sure you will agree that the steps taken to prepare and dispatch this commission to Africa, as well as to act on its recommendations, were logical and well advised. Working together as the members did in Africa, duplication of effort which might have resulted from separate investigations was avoided, and they had the great advantages of daily contact, exchange of ideas, and appreciation of results. I must add that the expense of the commission was borne by the participating governments—with a small grant from the Health Organization of the League.

INQUIRIES INTO INFANT MORTALITY

There are inquiries into the causes of infant mortality being carried on under the auspices of the Health Organization in selected urban and rural districts of England, Austria, France, Holland, Germany, Italy and Norway in Europe, and the Argentine, Brazil, Chile and Uruguay in South America. Several delegations to the Assembly of the League of Nations had asked the Health Organization to arrange an international study of the causes of infant mortality. The Health Committee of the League asked the advice of a number of child health experts, including Dame Janet Campbell of the British Ministry of Health, Pirquet of Vienna, Debré of Paris, Gini of Rome, Collett of Oslo, Gorter of Leyden, and Clark of the U. S. Public Health Service. These experts advised a study of infant deaths in selected districts of the countries listed above. This study applies to infants dying during the period of the inquiry, so that before and during the last illness every resource of science may be utilized in seeking the causes.

Interesting results have already been secured; for instance, there is a marked contrast between the causes of death as registered for official purposes and the real causes as elicited by the inquiry. The marked influence of prematurity on the infant death rate has been noted in all the European countries. Frequent meetings of the experts in charge of the inquiries guarantee that the studies will be carried out along similar lines and that the varying experience of the different countries will be comparable. A considerable amount of interest in the prevention of infant mortality has been aroused by this international consultation, which should lead to the better conservation of child life—perhaps by arousing healthy national rivalries. A

volume describing the results of the European inquiry will be issued in 1929.

HEALTH INSURANCE AND PREVENTIVE MEDICINE

A conference on Health Insurance was held last year in Geneva. To an American audience I presume this requires explanation, for health insurance on a governmental basis does not exist in the United States, and there has been serious opposition to the suggestion that it should be introduced. But in Europe health insurance is a fact, and its operation and results must be taken into account. As a rule health insurance is carried on under governmental supervision by more or less self-governing insurance organizations organized on a local or territorial basis. These organizations have been led by their unfortunate experience with such diseases as rheumatism and tuberculosis to attempt the application of preventive measures for the benefit of their members.

As the medical benefits accruing to the worker are usually also extended to the dependent members of his family, these organizations have been led to take measures for the protection of children and mothers. In view of the large populations involved (15,000,000 in England, nearly 40,000,000 in Germany, for example), and the comparatively large resources available, the efforts of health insurance organizations along preventive lines have quite naturally led to some duplication of services provided by governmental health agencies.

The Government of Czechoslovakia requested the Health Organization to take up the study of this question with a view to the more economical and effective prevention of disease. A conference on this subject was held last year in Geneva, under the chairmanship of Sir George Newman, Chief Medical Officer of the British Ministry of Health. There were present 6 representatives of public health services, nominated by the Health Organization of the League, and 6 representatives of health insurance organizations, nominated by the International Labour Office.

The Conference decided that the most practical way to proceed was to study the interplay of preventive effort in selected urban and rural districts of countries where different forms of health insurance were in force, in order to secure exact information on which to base recommendations for improvement and better coördination of effort. For instance, a sub-committee was set up to study tuberculosis prevention, another to report on the protection of mothers and infants, a third to deal with the measures applied to conserve the health of the child of school age, and so on.

These studies have been made, and the general committee will soon meet to discuss the results. I do not imagine that any dramatic reform will result immediately, for in this field change comes slowly. But here again is an example of a complex social problem of interest to a large number of governments being studied collectively instead of separately, with all the advantages inherent in this method, and the coördinating mechanism is again the Health Organization of the League of Nations.

The limits of space forbid me to go into further detail concerning the work of the Health Organization, although I have only touched superficially on a few of its activities. I have said nothing of the Malaria Commission which has been invited by the Indian Government to study the subject in India, and no reference has been made to leprosy, ship fumigation, rabies, smallpox and vaccination, cancer, vital statistics and syphilis, all of which are being studied in the international field by the Health Organization. These and other activities are described in the annual reports and other publications of the Health Organization which may be secured from the World Peace Foundation, 40 Mount Vernon Street, Boston, Mass.

As I have insisted throughout on the rôle of the Health Organization as a method of collaboration, I must not close without paying special tribute to Surgeon General Cumming, who has given us frequent evidences of his friendship, and has on many occasions extended to the Health Organization, and through it to the public health services of other countries, the collaboration and support of the U. S. Public Health Service.

The organization of international relationships in the complicated world in which we live may leave much to be desired; but may we not say that very considerable progress has been made?

REFERENCE

1. Sly, John F. Genesis of the Universal Postal Union. Carnegie Endowment, 1927.

Life is a Relay-race

LIFE is a great relay-race, and we cannot clearly see the goal. Each just runs his short lap and then hands on the torch. To one who nears the end of his lap it is a relief to know that young and strong runners are in sight. In these times science gives her prizes to the discoverer and treats the expositor with indifference; she smiles on the man who grows the corn, but overlooks him who bakes and distributes the bread. Yet for the welfare of knowledge both kinds of men are needed.—Foreword to *Good Health*—By Ian S. Thomson, 1929.

Coördination of Research on Sewage and Industrial Waste Disposal*

CLARENCE M. BAKER, M. C. E., FELLOW A. P. H. A.

Engineer, American Paper & Pulp Association, New York, N. Y.

PUBLIC health engineers are entering a new phase of stream pollution activities. Originally their efforts were directed almost exclusively against pollution affecting the public health. Later jurisdiction was extended to include welfare or comfort in order to include definitely those indeterminate conditions commonly designated as nuisances and which affect public health only indirectly, if at all. Recently public demand has necessitated consideration of pollution affecting fish and other aquatic life, that streams may be conserved in a reasonable state of purity for recreational and similar purposes.

The importance of domestic sewage in the transmission of communicable disease has justly focused the attention of health officials on this phase of the problem, notwithstanding the fact that in many cases the demand of industrial waste upon the oxygen resources of the stream is many times greater. Health officials have been loath to direct their efforts to pollution affecting fish life but are now finding it necessary to do so because of public demand, or else permit the establishment of such activities in other state departments which results in duplication of effort, misunderstandings and conflicting jurisdiction.

ANALYTICAL METHODS

The starting point with any problem of industrial waste disposal or stream pollution is analytical. Uniform analytical technic must be developed in order that the effect of the wastes upon the streams may be measured, and methods of disposal or treatment evaluated and reported in comparable figures. *Standard Methods of Water Analysis* was originally developed for the control of potable waters, but later extended to cover in a reasonably satisfactory manner the analyses of sewage and sewage effluents. Recently feeble attempts have been made to adapt these methods to the analyses of industrial wastes, but because of their greater concentration and composition

* Read at a Joint Session of the Public Health Engineering and Laboratory Sections of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 19, 1928.

such a procedure is impractical without material modifications made according to the individual views of the chemist in charge of the particular work, which has resulted in great discrepancies in the technic used in different laboratories.

Probably the greatest difficulty or discrepancy in the application of *Standard Methods* to the analyses of industrial wastes is in the very essential biochemical oxygen demand test. Here little variations in technic frequently make considerable differences in the results. In one state tap water was originally used for dilution, but comparable results could not be secured in different sections of the state, so distilled water, to which 500 p.p.m. sodium bicarbonate has been added, is now used. Another state is using distilled water without the bicarbonate, and in others tap water is still being used. Investigations have indicated that the use of distilled water produces results about 35 per cent lower than tap or synthesized water. With such variations in technic, comparable and consistent results cannot be secured.

With the development of coöperative programs in waste disposal between industry and health officials, industrial chemists find it necessary to apply sanitary analyses to a study of their local conditions. In referring to *Standard Methods* they find essential explanatory data lacking regarding basic principles and the significance of the analytical procedure. A like situation exists with a student or other individual who is just taking up the question. In order to apply the analytical procedure successfully and uniformly there must be a rather definite understanding of the basic principles and significance of analyses. It seems, therefore, that *Standard Methods* should include more definite, descriptive basic data. In other words, the publication should be written more in the form of a text than at present.

WASTE UTILIZATION AND TREATMENT

Industrial waste disposal may be divided into three definite steps:

1. Utilization of the wastes within the industry, which is primarily a problem for industry itself, and should be given first consideration.
2. Treatment of the residual wastes after as complete utilization as practical, which is more specifically a problem for sanitary engineers and state officials in coöperation with industry.
3. Stream surveys to determine the effect of the wastes upon the stream, the extent of waste treatment necessary, and the results of improvement made, which is primarily a function of the state.

While utilization of the waste within the industry is essentially industry's problem, the sanitary engineer must keep in close contact with developments to correlate them with the second and third stages

of the problem. Some contend that treatment of the waste is wholly a problem for industry, but there is now a tendency toward assisting industry, through state departments, in solving this difficult problem. Certainly the sanitary engineer is in better position to suggest methods of treatment and direct coöperative activities because of his intimate knowledge of such processes, based upon his experience with domestic sewage. It is the writer's belief that while the major cost of developing treatment processes for industrial wastes should be borne by industry, the state should be in a position to lead, and in some cases direct, experimental work.

Industry's first and principal consideration—waste utilization—involves not only the question of stream pollution, but also economical considerations. Outstanding examples in this respect include:

1. Reduction of the population equivalent of wastes from the Corn Products Plant at Argo, Ill., from 370,000 to 50,000 by waste utilization, resulting in a saving of $3,000,000 for a treatment plant and a financial return of probably $500,000 annually in the value of recovered products.
2. The installation of $41,000 worth of equipment in a certain paper mill which reduced the fiber losses from $160,000 to $30,000 annually.
3. Recovery processes developed in the by-product coke industry which have provided economical methods of utilizing phenol wastes, a most objectionable source of pollution of public water supplies.

Industry needs to be awakened, however, to a realization that utilization of its waste is not only a question of financial return, but also of developing economical methods of waste disposal. While an installation may not result in a substantial financial return, it may provide an economical method of waste disposal.

Although there is room for improvement in methods of sewage treatment, accepted and practical methods have been developed and are in operation. There has been some study in regard to the treatment of certain industrial wastes, but in no instance has an accepted method been developed. Research in the treatment and disposal of industrial wastes is, therefore, one of the primary needs of the present time, and any program for stream improvement which does not take this into consideration is incomplete.

COÖRDINATION OF ACTIVITIES

New organizations or associations to study these problems seem unnecessary, but coördination of existing ones is essential. The administrative agencies should undoubtedly be the state departments of health. Provision for interstate agreements such as have been perfected in the Ohio River and Lake Michigan watersheds is desirable.

An advisory council on which all interests are represented is a valuable asset. Stream pollution cannot be controlled effectively by prohibitory legislation. In fact, such legislation is destructive and inimical to public interests. Legislation should establish an organization supported by ample funds to conduct a constructive, sustained, coöperative program in a study of the problem, both with reference to the effect of pollution upon streams and aquatic life thereof, and methods of waste utilization and treatment. Department of health activities in the various states may be adequately coördinated through the Conference of State Sanitary Engineers and the Public Health Engineering Section of the American Public Health Association.

There should be local committees representative of the different branches of industry in each state to coöperate with the state department of health. Such coöperative programs have already been inaugurated in at least 7 states—Minnesota, Wisconsin, Michigan, Ohio, Pennsylvania, Maryland, and Connecticut. In some instances these local committees have been formed at the request of the state officials, in conferences with representatives of the various branches of industry. Practically every state, however, has either an aggressive chamber of commerce or association of industries.

As representative of the American Paper and Pulp Association, the writer recently assisted in developing an organization through the Associated Industries of Connecticut in coöperation with state officials. The organization in Connecticut provided that the Associated Industries appoint committees representative of their respective branches of industry interested in the problem of stream pollution; the chairmen of these committees then constitute a central committee representative of industry in the state as a whole. Some nine or ten industries of Connecticut have been thus organized. It seems consistent that this policy be followed in other states where industry has not already been organized.

The organization of industry, however, needs to go further than state committees to provide adequate means for interchange of ideas and data. The pulp and paper industry, realizing the national scope of the problem, is organizing its activities and coördinating the work of its local state committees through its national organization, the American Paper and Pulp Association. It is believed that this industry is the first and only one to place a full-time representative in charge of these activities. The National Canners Association, however, has given some consideration to the problem and has coöperated in research conducted in various states.

The work of other industries could doubtless likewise be coördi-

nated through their national trade organizations. The national representatives of the various industries could then constitute a central national committee to act as a clearing house to assemble and disseminate data of general information. This national organization of industry could then coördinate its activities through the Conference of State Sanitary Engineers and the Public Health Engineering Section of the American Public Health Association. In fact it seems essential that such or similar channels of communication and types of organizations be developed if the most economical and practical methods of handling this problem are to be brought about.

SUMMARY

The essence of these remarks may be summarized as follows:

1. *Standard Methods of Water Analysis* should be revised and extended to cover more adequately the analyses of industrial wastes.

2. With proper coördination, existing organizations, including state or other local conferences of sewage plant operators, the American Society of Civil Engineers, Conference of State Sanitary Engineers, and the Public Health Engineering Section of the American Public Health Association, can satisfactorily handle research in sewage disposal.

3. The administrative agencies in control of all stream pollution activities should be the state departments of health, with suitable legislation and financial support.

4. Local state committees representative of the various industries should be developed in each state to coöperate with the state department of health. These local committees should be coördinated through a central state committee representative of industry as a whole.

5. The activities of the local state committees of each industry should be coordinated through the national organization of their respective industries.

6. National representatives of the various industries should constitute a central national committee to coöperate with the Conference of State Sanitary Engineers, Public Health Engineering Section of the A. P. H. A., Izaak Walton League, and others, in the exchange of ideas, collection and dissemination of data, and general coördination of all efforts.

7. Finally, public health officials and others interested in improving stream conditions, both in their local state activities and through their national organizations, should give more definite recognition to industry in consideration of the problem, and industry should be given ample opportunity to express itself regarding the various problems.

Outbreak of Botulism, Westfield, N. Y.

EDWARD CLARK, M. D., FELLOW A. P. H. A.
District State Health Officer, New York State Department of Health, Buffalo, N. Y.

ON December 29, 1928, I received an emergency request from Elmer W. Powers, M.D., Health Officer of Westfield, N. Y., to go with him and Van S. Laughlin, M.D., to see some cases which were puzzling them as to diagnosis.

The two cases which I saw were typical of botulism. Three had died before I arrived, but the histories, given by Dr. Laughlin, indicated that they were also typical botulism. I made a rather brief investigation which revealed the following facts:

A dinner was given at the home of James Dina, Westfield, N. Y., on Christmas day, at about 4 P.M. The company, 24 in number, represented two families living in Westfield and one in Fredonia, and was made up about equally of adults and children. The food consisted of freshly killed chicken, macaroni and cheese, bread, potatoes, green and yellow home-canned string beans.

The following cases had occurred up to the time of my visit:

1. Mrs. James Dina, age 55, first showed symptoms of illness on December 26 at about 4 P.M. She was slightly nauseated at first and vomited a little; later she began to have difficulty in articulation and deglutition, gradually growing worse. When I saw her she could neither speak nor swallow. She complained of difficulty in distinguishing objects. Her pupils were dilated, with sluggish response to light. There was great muscular weakness and an accumulation of mucus in the throat which she was unable to cough up. There was no rise of temperature at any time, but a rather rapid pulse. She died at 6 P.M., December 29.

2. Santa Mella, age 4, living at Fredonia, became ill December 27 early in the morning. She vomited a little, soon became helpless, had difficulty in articulation and deglutition, and an accumulation of mucus in the throat. She died on December 27, at 11 P.M.

3. Josephine Grizanti, age 4, became ill December 27 at 9 A.M., and showed the same symptoms as described. She died December 28 at 10 A.M.

4. James Grizanti, age 22, was taken ill on the evening of December 26. Dr. Laughlin saw him first on December 28 at 5 A.M. He vomited frequently, and was the only one of the cases who complained of abdominal pain. There followed difficulty in articulation and deglutition. He died on December 28.

5. In Sam Dina, age 14, the onset of illness was December 27, about 4 P.M. He had difficulty in swallowing, dilated pupils, with slow response to light. He died three or four days later.

6. Rose Dina, age 9, became ill December 28, about 4 P.M. She vomited at

intervals, had no pain, no difficulty in swallowing, no rise of temperature, a normal pulse, but dilation of the pupils. She recovered.

Two boys in the Grizanti family, Cosmo, 14 years, and Joseph, 18 years, had attacks of vomiting on December 28, about 3 P.M., but no other symptoms.

It was impossible to secure any of the food eaten at this dinner, as it had been thrown out for the chickens. Two cans of beans put up at the same time as those served at the dinner were obtained, and sent to the New York State Laboratory for examination. The report on them was negative.

The Dina family found a can from which beans were served and had not been washed. This was examined by Dr. W. E. Cary of the University of Chicago, who has reported as follows:

> There was not sufficient toxin in the washings from the empty can which we obtained to kill any of our animals by direct feeding. However, after culturing the washings on beef heart media, we secured a very potent toxin which has killed guinea pigs in dilutions of 1:100 when fed by mouth. The pigs controlled with Type A antitoxin did not die, which indicates fairly clearly that there were spores of Type A botulinus remaining in the washings of this can. . . .

That the beans were infected with the *B. botulinus* is further proved by a summary prepared by Dr. Laughlin. All who ate them even in small quantities were ill, and most died. One (Rosa Dina), who denied having eaten beans, was ill with typical symptoms, but recovered. Those who did not eat beans escaped illness. With one exception, none of the patients showed evidence of mental dullness, or rise of temperature. All of them had rapid pulse.

Study of Effect of Environment on Quality of School Work—Germany

IN an effort to ascertain the effect of home environment on school work, a study of more than 800 public school boys and girls, ranging in age from 11 to 14 years, has been made in two cities of Germany. The quality of the child's work was judged by his advancement in school; no intelligence nor other tests were given. Only children of families with a moderate or low income, in which both parents were living, were included in the study.

The investigator found that the lower the economic standing of the family, the poorer the child's school work. For instance, of the children of unskilled workers about 50 per cent were retarded in the lower grades, the proportion being even greater for those in the higher grades. These conditions are attributed by the author largely to faulty hygiene, disease, and physical weakness, which are more prevalent among the poorer families, and partly to inherited lack of ability.—*Ztsch. f. Kinderforsch.*, Berlin, 35, 1: 7, 1929.

Measurements of Efficiency and Adequacy of Rural Health Service*

HARRY S. MUSTARD, M. D., FELLOW A. P. H. A.,
and JOSEPH W. MOUNTIN, M. D.

Director Rutherford County Child Health Demonstration, Murfreesboro, Tenn.; and U. S. Public Health Service, Nashville, Tenn.

THE efficiency and adequacy of a local health service is or should be the concern of four groups: the people receiving the service, the taxpayers who shoulder the burden, the local workers rendering the service, and the state and national health agencies promoting or supervising the local service. To these groups may be added a fifth, the detached students of administration whose critical judgment is of great value. The determination of efficiency and adequacy is more than the application of a performance test. Many criterions must be taken into consideration, the principal of which are: nature and extent of the problem, character of program, service rendered, and in so far as can be measured the results attained.

No program can be considered either sound or satisfactory unless it is based on the needs of the area. Certain problems are more or less common to all areas, among which may be mentioned sanitation, control of communicable disease, and child health; yet the nature and extent of work necessary to handle these satisfactorily varies with the community. Malaria, hookworm, trachoma, industrial diseases and hazards, and the like, may be problems. In the beginning the administrator may obtain sufficient general information to define his problem through a study of morbidity and mortality data coupled with a hasty field survey. Later more detailed information concerning individual citizens and premises should be obtained. Throughout the succeeding years, an analysis of suitability of program to the problems should be made, but it should be based on records compiled by the health organization, from which should be determined not only the actual health status of the area, but also the effectiveness of the methods employed.

Next in importance to an analysis of the problem is the projection

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of a program designed to effect its solution. All too often, health departments merely meet situations as they arise or carry on stereotyped programs handed down from predecessors. A high degree of efficiency cannot be attained except when following a charted course. At the present time, scarcely a single rural health organization is sufficiently manned and financed to carry out a complete and balanced program. Other factors enter: certain functions are defined by law and must be performed irrespective of worth until the law can be changed; epidemics and disasters will arise necessitating concentration along certain lines.

In general, the factors guiding program planning should be: the relative need for a given amount or type of service; the ease with which results may be attained; and the greatest good for the greatest number. Sight should not be lost of important factors in public relations such as: popular demand, desire for local service, and the creation of a feeling that the situation is being handled. A bit of the dramatic will lend color, and a paramount issue will stimulate interest. No attempt, however, should be made to enter a field unless a reasonable concentration of service can be attained, since dilution of effort beyond a certain point amounts to nullification.

RECORDS AND REPORTS

It is upon records and reports that measurements in detail must be based, and the importance of this subject warrants considerable discussion. However troublesome these records and reports may seem, there is no justification for neglecting either. Systems now in vogue are burdensome because of detail which serves no useful purpose. One system is usually copied from another, and the chief concern seems to be what might be included rather than what might be omitted. Yet despite this plagiarism, differences exist which render difficult or impossible the compilation of comparable data necessary for analysis and study.

The influence of the hospital and dispensary can be seen in all forms used by welfare stations; field nursing records bear the stamp of the visiting nurse; and communicable disease forms have been handed down by the epidemiologist concerned with investigation rather than control. Reports are even more troublesome than records, since the rural health organization as well as individual workers within the organization are required, as a rule, to render reports to several agencies. Each agency participating in local health work has a special form and no other will satisfy its purpose. This confusion will continue until records and reports find a common origin in

sound public health administration. There are four elements in a complete system of records and reports: (1) basic case records, (2) daily record of activities of individual workers, (3) periodic summary of progress, and (4) annual analysis.

The purpose of the case record is to provide space for entering data which may assist in handling a given case or situation, or which may have value for statistics or study. If this purpose is adhered to rigidly, the form becomes remarkably simple and analysis of the data presented does not become insurmountably difficult. The daily record kept by the individual workers should be merely a record of service and only a key to the basic case record where more detailed description of the service can be found. By the use of a code for the several services, the same form may be used by the different workers. Any complicated system is doomed to failure, and unless entries are made in the field when the work is performed, the data are certain to be inaccurate. The periodic summary should be brief, based on a sampling of activities. It has a twofold purpose: a check on progress, and a concise report of service rendered. Beyond this, it should not go. Any attempt to gain a complete picture by a monthly cross-section is futile. Here, too, the guiding principle should be, what can be omitted rather than what might be included. Its brevity need not be a cause for worry if the right type of annual report is used, and if its form is made known to the local health officer in advance. The annual analysis should constitute the main report of the organization. It should be complete and searching, giving a picture of the problem, the service rendered, the results accomplished, and the money spent.

The question arises as to what should be the common origin of reports and records. It has been stated in this paper that the origin should be sound public health administration. *The Appraisal Form for Rural Health Work* developed recently by a sub-committee of the Committee on Administrative Practice of the American Public Health Association more nearly represents public health opinion than any available document. The corollary, then, is that records be built around the *Appraisal Form.*

APPRAISAL

Appraisal, used in the sense of estimating quantity, quality or value of service, is practiced by interested persons wherever the service is established. Most frequently, it is based on personal opinion, a few going a step further and comparing the work of one area with that of another, or present conditions with past. The assignment of numerical values to various items has been used for many years in

the field of sanitation. More recently this principle has been applied to other health services.

The *Appraisal Form for Rural Health Work* is an attempt to combine the experience of workers in this field. However, any method of appraisal has very definite limitations and there is always the danger that it may become an end in itself rather than a means to the end. Its primary purpose is to measure service rendered; secondarily, its standards of performance may be used as a working plan, but only in so far as the administrator may choose to be guided by the judgment of others should he allow any method of appraisal to shape his program.

Since we possess rather meager information concerning the interrelation of problems and practices under different circumstances, each specific activity or accomplishment must be appraised separately, and possibly with a standard applicable to the particular item in question, but not to any other service or result. Thus satisfactory and correct measurement will be possible only when the rural health problem has been analyzed before projection of the program, when projection of program has been undertaken with certain itemized goals in view, and when records of services and results have been kept in such a manner that the data required for measurement of efficiency or adequacy of service will present in detail how much progress has been made toward the goals previously set up.

ADEQUACY AND EFFICIENCY OF PERSONNEL

In connection with measurements of health service, it should be borne in mind that an organization may be rendering adequate service and yet not be efficient, or the converse. Two entirely different qualities are being rated, and these should, but do not necessarily bear direct relationship to each other. In the A. P. H. A. *Appraisal Form*, for instance, the type and volume of service rendered to the community is the basis of measurement from which a score is determined. In other words, the present form sets forth the kind and amount of service which should be rendered but throws no light on personnel and budget requirements. Those concerned with administration frequently wish to know what personnel is required for the performance of a given amount of service. This information is needed when projecting a budget or a program or when attempting to appraise the work of an individual. Without this information the appraiser cannot definitely state whether a community is receiving full value for the money expended, or, what is more important, whether a low score is due to the inefficient health organization or to the niggardliness of the commu-

nity. At present, no data on performance of individuals working under a wide range of rural conditions are available. Under the circumstances, no statement, nor even a guess, can be hazarded concerning adequacy of personnel or budget or method of measuring the efficiency of individual workers or the organization as a whole.

GENERAL CONSIDERATIONS

Originally, rural health service was a city institution incorporated into an entirely different structure. Programs, policies and criterions are a carry-over. Up to the present time, very little carefully checked data on rural health conditions as affected by health service have been assembled. The meager information available is mostly of the cross-section type and coincidental circumstances are grasped as supporting arguments. There remain to be determined what the results are and how they can be attained.

In spite of its weakness, service rendered forms the basis of most of our appraisal efforts. The measurement of such services will yield true indexes of adequacy and efficiency in proportion to the soundness of the assumption that the prosecution of a particular activity will bring about a particular result. Certainly such appraisal is valuable; certainly a study of service rendered will determine whether or not an organization is engaging in a balanced program according to a somewhat empirical pattern, but endorsed by the unhurried judgment of competent observers. It would be unsafe, however, to allow measurement to depend entirely upon appraisal of service rendered. Possibly, on an annual basis, such measurement is the most satisfactory index of potential accomplishment, but on the other hand, it should be supplemented by studies of such morbidity and mortality rates and trends as may be proved to be safe indexes.

The very nature of the general subject indicates that no satisfactory system of measurement of adequacy and efficiency will, or should be built up as a suddenly completed instrument. What and how to measure will become better understood as real scientific data are accumulated. It must be admitted, also, that in every health program there are certain intangible services and results not amenable to weighing and measuring, but this is no reason for discouragement. Measure and evaluate whatever is amenable to such treatment and it is entirely possible that the measurable factors may be found to bear a rather constant relation to those now considered unmeasurable.

No attempt has been made to set up any new method of evaluation of health service. Rather, this has been a discussion of difficulties and possibilities which seem to be inherent in present units of measure and

factors measured. There is nothing in this treatment of the subject that would warrant conclusions, but the following summary may be significant.

SUMMARY

1. It does not seem practicable at this time to determine or measure all of the indexes of efficiency and adequacy of rural health service.

2. It does seem practicable and desirable to determine and measure such indexes as are amenable to this treatment.

3. An index of accomplishment must represent a specific item where cause and effect may be specifically demonstrated.

4. There appears to be need for accumulation of scientific data substantiating assumption that the prosecution of a given activity will be followed by a specific result.

5. There appears to be need for determination of what mortality and morbidity rates or trends may be accepted as indexes of accomplishment, and what population unit, or number of years' experience, shall be considered as essential for credit of such rates or trends.

6. There appears to be need for determination of specific standards of efficiency for various personnel employed.

7. Measurement of rural health service should be based upon a study of efficiency of personnel, adequacy of service and results obtained.

A Few More Recent Arguments in Favor of Pasteurization

Washington, N. J.—Two hundred and two cases of scarlet fever due to raw milk, 192 of which occurred within 6 days—May 26–31, 1927.

Plymouth, Mass.—One hundred and twenty-seven cases of scarlet fever, 101 of which were primary, occurring on one milk route which supplied raw milk to approximately 250 families. For 5 years previous to this outbreak in a population of some 13,000, the yearly average of scarlet fever had been 12 cases.

Wayland, N. Y.—One hundred and forty-one known cases of septic sore throat, including the proprietors of the dairy—husband and wife. Forty employees in one factory were off duty. Practically all of the victims became ill within 3 days—February 16–18, 1928.

Savannah, N. Y.—Seventy-five cases of septic sore throat, all falling ill within 8 days—March 10–18, 1928.

Lee, Mass.—Nine hundred and fifty cases of septic sore throat, occurring within 2 weeks, with 48 deaths.

Do we need further argument to show the importance of pasteurization?

Some Unsolved Child Labor Problems*

ETHEL M. JOHNSON

Assistant Commissioner, Massachusetts Department of Labor and Industries, Boston, Mass.

AS long as there is child labor, there will be child labor problems—special problems that do not apply in the case of adult workers—that arise from the physical weakness of children, their immaturity, their ignorance, and their helplessness.

One of these problems is the protection of children employed in industrialized forms of agriculture, and this is by no means confined to migratory workers. It is a difficult matter to deal with because of the popular conception that such work is confined to useful tasks on the home farm, doing chores for a neighbor, or earning a few pennies picking berries.

It is not such tasks which constitute the problem. It is where numbers of children are brought together to work under virtually industrial conditions, with foremen or overseers in charge, that the serious problem is created.

Of the thousands of children under 14 and under 16 years of age listed in the federal census as employed in agriculture, a considerable proportion—in some states, such as Massachusetts, the majority—are recorded as employed on other than the home farms. Many of them are working doubtless in the gardens of the Imperial Valley, on the beet fields of the middle west, on the truck farms of the Atlantic coast, and on the tobacco plantations of the southern states and New England.

Although this work is frequently carried on under conditions that at least approximate those in the factory, there is practically no regulation. Some of the states specifically exclude farm labor from the application of the labor laws, thus leaving children as well as adult workers largely without protection.

The failure of most of the state child labor laws to deal with the situation is in part due to the fact that many of these laws were enacted before the employment of children in certain forms of agriculture had developed on an industrial scale.

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* Abstract of address given at the Convention of the Association of Governmental Labor Officials of the United States and Canada, New Orleans, La., May 23, 1928.

Massachusetts has, in general, high standards for working children. Yet aside from the school attendance laws, there is little protection afforded to the children who work on the onion and tobacco plantations in the western part of the state. There is not even a record of the numbers employed, as the work is carried on mainly during the summer months when the schools are not in session. The youngest children do not even have to be certified for this work.

People in a position to know have estimated that during the height of the season, several thousand children—boys and girls under 16 years of age—are employed on the plantations; and that the majority of these workers are under 14 years of age. As many as 100 are sometimes employed on a single plantation.

There is practically no regulation of working conditions; no limitation of the hours, other than the night work limits for all children under 14 (prohibition of employment before 6:30 A.M. and after 6:00 P.M.); and there is no age limit. Young children are desired for the work on the shade grown tobacco, to pick the lower leaves that grow close to the ground.

It is very hot and sultry under the tents during the months of July and August. There have been instances reported where horses working under the tents have died as a result of the excessive heat. That suggests what the conditions may mean in the case of young children, and there have been stories of children overcome by the heat and humidity.

There are, from time to time, reports from people in the vicinity of the plantations of moral hazards in this work, of bad working conditions, long hours, and sometimes of harsh treatment by the overseers. In the absence of definite regulations it is not possible to say to what extent such conditions, and others injurious to children, may exist.

There are difficulties in the way of securing legislative regulation of child labor in agriculture. It should not be impossible, however, to frame legislation which will permit regulating the employment of children in forms of agriculture which have become industrialized, and to check abuses wherever found, without interfering with the legitimate work of boys and girls on their parents' farms.

Safeguarding the health of children entering or already in industry is a matter which deserves more attention than it has yet received. Although the majority of the states have some provision for health certification for young children before they are permitted to enter employment, a number make no provision. In the case of some of those that do, the requirement for an examination is optional with the official who issues the permits.

Massachusetts is listed as one of the states where the requirement is mandatory. There is, however, a loophole in the health certification law which very greatly impairs its effectiveness. The law provides that every child between 14 and 16 years of age who wishes to go to work must present a health certificate from a physician who certifies that he has thoroughly examined the child and found him in sufficiently sound health and physically able to perform the work for which he is applying.

It was intended that this examination should be made by the school physician. By slipping in the words " or family," it was left for any physician to make the examination and issue the health certificate. In its operation, " family physician " means any physician who will sign the certificate, the result being that if a child is refused a certificate by one he has simply to go to another, until he finds one who will sign. The protection intended by the law is thus largely destroyed.

In some of the cities of that state, the work is assigned to one of the school physicians appointed for this purpose and is conscientiously performed. In other places, however, there is little attention given to it; and the admission is frankly made that the work is not being properly done.

A recent check-up made for a private agency, covering a representative group of cities and towns, showed that in many localities the work is superficially done; that in many places there is no standard for the examination; and that practically no children are rejected as physically unfit.

Many who are interested in the protection of children would like to see the responsibility for this work placed definitely with the school officials as originally planned. They would also like to see a properly qualified physician put in charge, given an adequate salary, and allowed time to visit industrial establishments to learn about the occupations in which children are employed.

The health certification of children entering industry has a direct bearing upon their health after they have gone to work. Aside from the provisions of the statutes of some of the states excluding children under certain ages from specified occupations presenting definite health hazards, little attention is given to the health of children once they have become wage earners.

There is need for more studies dealing with the health of working children, the effect of industry upon young children, and the effect of certain kinds of employment, so that there may be intelligent revision of the lists of those prohibited, in order to cover new hazards that have arisen since the original lists were adopted. Such studies should help

to indicate the kinds of employment that are safe, and the kinds from which children with certain physical defects should be excluded. They should tie up with the health certification for children entering industry and show how that important initial work can be strengthened and improved.

Prevention of accidents to employed children, and to all industrial workers, has received more attention than the other problems mentioned. A good deal has been accomplished, but much remains to be done. As long as boys and girls are maimed in industry, and young lives are sacrificed, the problem is not being met.

The Massachusetts child labor laws make careful provision to exclude children from industrial hazards. Prohibition against employments involving accident hazards extend to boys and girls up to 18 years of age. The Massachusetts State Department of Labor and Industries is given authority to add to the lists of prohibited employments for minors under 18 and under 16 years of age; and to exclude minors from any specific machine where there appears to be an accident hazard. This authority to act in individual instances is utilized from time to time. The general authority, however, to add to the list of prohibited processes has never been used by the present department; and only in 3 instances was it used by the former State Board of Labor and Industries.

Although the list of prohibited employments for children under 16 years of age is fairly comprehensive, and includes something like 20 different kinds of machine work, boys and girls below this age are still permitted to work " in connection with " some very dangerous machines. One of these is the spinning mule. Boys of 14 and 15 are frequently employed as back boys on the mules. Sometimes very serious, even fatal accidents occur. There was one very terrible accident where a boy of 14 was caught between the heavy steel carriage and the breast beam and crushed to death. Another boy of the same age in a similar accident escaped with a badly broken leg. An older boy, cleaning the machine while it was in operation, was caught and his head crushed. Still another, winding the sticks while the carriage was running, received a double fracture of the jaw and lacerations of the head and face.

One of the most dangerous machines in industry, as far as children are concerned, is the freight elevator. Most of the fatal accidents to boys under 16 years of age in Massachusetts industries occur " in connection with " freight elevators. The majority of the non-fatal elevator accidents to minors involve boys under 16.

Of 121 elevator accidents to minors investigated by the present

Department of Labor and Industries, 68 were sustained by children under 16, and of 23 fatal elevator accidents, 14 occurred to boys under 16. Of 6 fatal accidents to children under 16, investigated by the department in 1926, 2 were " in connection with " freight elevators. In one case a boy of 13, illegally employed in an industrial establishment, was crushed to death.

It should be noted that the Massachusetts law prohibits the employment of minors under 16 years of age " in operating, cleaning or repairing freight elevators." It does not, however, prohibit the employment of such minors " in, on, about, or in connection with " freight elevators, and it is in work that comes under this classification that most of the accidents occur.

A few states are trying to prevent, or at least reduce, industrial accidents to children by requiring extra compensation in the case of those injured when illegally employed, making this a direct penalty upon the employer against which he is not permitted to insure. The majority, however, have no such provision. Some even specifically exclude from their compensation laws those injured in the course of illegal employment. In Massachusetts, the question whether illegal employment is covered by the compensation laws has not been decided by the courts.* In the absence of a court opinion, the Department of Industrial Accidents grants the award.

The Massachusetts law makes no specific provision for an additional award in the case of injuries to children arising out of illegal employment. There is a provision to permit an extra award in the case of accident, whether to adult or minor, due to the wilful misconduct of the employer or his agent. In only a few instances has such an award been made, and in view of a court opinion it is of little practical value.

All of the problems mentioned present difficulties, but they are not insuperable. It is not unreasonable to look ahead to the time when legislative protection shall be given as a matter of course to all child workers regardless of the nature of their employment; when child labor in agriculture, as well as in factories, will be covered by regulations requiring fair working conditions; when adequate provision will be made through enforceable regulations to safeguard the health of children going into industry, and after they are in; when laws that were excellent at the time of their passage, but have gotten behind the times, will be revised to meet changing industrial conditions.

* An opinion of the Supreme Judicial Court of Massachusetts, May 29, 1929, apparently establishes the right of compensation in case of injury arising out of illegal employment.

Iodine in Water, Food and Urine

H. W. CLARK, FELLOW A. P. H. A., AND GEORGE O. ADAMS

Chief Chemist, Massachusetts Department of Public Health, Boston, Mass.; and Chemist, Lawrence Experiment Station, Lawrence, Mass.

MUCH has been written of late years in America concerning iodine in water, and its introduction into public water supplies which are deficient has been strongly advocated by some as a public health measure. Certain cities and towns have, moreover, adopted this procedure in an attempt to prevent or minimize thyroid troubles. During 1925 and 1926 the iodine in about 100 of the public water supplies of Massachusetts was determined and found to vary from none to 6.33 parts per billion. These results were given quite fully in the reports of the Department of Public Health of Massachusetts for 1925 and 1926. A more complete study of iodine in Massachusetts waters and elsewhere was given in a paper by H. W. Clark.[1]

In all this work attention has been called to the fact that we are not dependent upon water for iodine, as many vegetables and grains contain it in large amounts, and sea fish, especially certain species, are great carriers of iodine, as are marine growths, seaweeds, mosses, etc. Certain determinations of iodine in food have been made by the authors and by others. Some of this work has been summarized by the Bureau of Fisheries of the U. S. Department of Commerce in its bulletins. Among the many determinations of iodine in food made at the Lawrence Experiment Station may be given those shown in Table I.

TABLE I

IODINE CONTENT

	Iodine Parts per Billion		
Soft-shell clams	1,012	1,152	—
Quahaugs	197	130	205
Flour	16	9	—
Fresh codfish	1,056	946	—
Milk	17	—	—

It will be noticed how large the iodine content of these foods is compared with that of the Massachusetts water containing the greatest amount, namely, 6.33 p.p.b. As all these results made it evident that water furnishes only a small part of the iodine required by the human

body, it was decided to make some determinations of the excretion of iodine in order to show the comparative amounts taken in through water and the amounts excreted.

During 1928, 48 analyses were made of the urine of different individuals. The highest amount of iodine found was 210 p.p.b. and the lowest 5 p.p.b., the average being 41, or more than 6 times that found in the richest iodine-bearing water of the state. It was also found that there was a great variation in the amount of iodine in samples from different individuals, some giving uniformly higher results than others. It was also noticed that the amount of iodine was lower during warm weather. The average amount in the urine from 7 persons during April, May, October and November was 66 p.p.b., during June, July, August and September, 28 p.p.b. The low summer results are probably due to greater consumption of water at this season and dilution of the iodine taken in with food.

From the results of this work it is evident, in Massachusetts at least, that only a small percentage of the iodine entering and passing through the human system is obtained from water, and it is probable that the introduction of iodine into water supplies is more or less futile compared with selecting or preparing food, salt, etc., so that an amount of iodine sufficient for the needs of the body is taken in.

The method used by us for determining iodine in water has been given in the reports and article referred to. When this work was begun, however, it was found that there was no adequate or reliable method for the determination of iodine in urine; hence the following was developed at the Lawrence Experiment Station:

All organic matter must be destroyed, and owing to the large amount in urine the determination of iodine is much more difficult than in a sample of water. The usual method of burning the organic matter with oxygen presented so many difficulties that a different procedure was tried:

After evaporating 2,500 to 4,000 c.c. of urine with 10 gm. of caustic soda to the consistency of a thick syrup, it was transferred to a small iron pan, about 20 gm. more of caustic soda added, and the mixture heated slowly until fumes ceased to come off. This destroyed most of the organic matter at a comparatively low temperature. The resulting black clinker was ground in a laboratory hand mill and allowed to stand over night in a beaker with about 200 c.c. of alcohol to extract the iodides; the alcohol was then decanted through a filter, the residue washed by decantation several times with alcohol, finally placed upon the filter and again thoroughly washed with alcohol. A large part of the alcohol of the filtrate was then distilled off, the residue evaporated

nearly to dryness with 3 gm. of caustic soda in a nickel dish, the dish then heated slowly until the organic matter extracted was broken up, the volatile portion driven off and the remainder present as free carbon. The fusion was then dissolved, filtered, evaporated to a small volume, and a drop or two of approximately 1/10 normal arsenious acid added to reduce the iodates. The solution was then acidified with sulphuric acid, transferred to a separatory funnel and a few drops of strong sulphuric acid saturated with sodium nitrite added to liberate any iodine present. The iodine was then extracted with purified carbon tetrachloride and the amount present determined by comparison with a standard solution of iodine in carbon tetrachloride in a Dubosq colorimeter.

This procedure gave check results on duplicate samples and showed an average recovery of 75 per cent on known amounts of potassium iodide added to urine and carried through the regular procedure. This may appear to be a low recovery but it must be understood that the amount of iodine in the average urine analysis was only about 0.02 mg. or 0.00002 gm.

REFERENCE

1. Clark, H. W Iodine in the Public Water Supplies of Massachusetts, *J. New England Water Works Assn.*, 42: 204 (June), 1928.

Where Automobile Accidents Occur

AN interesting study of fatal automobile accidents in New York State has just been published by J. V. De Porte, Director of Vital Statistics in the New York State Department of Health. This shows that in 1927 out of a total of 2,555 deaths due to this cause, 1,091 occurred in the City of New York, and 1,464 in the rest of the state. Expressed in rates per 100,000 of population this shows 18.3 per 100,000 killed in the city and 26.6 in the rest of the state. In order to visualize the magnitude of these rates it may be well to compare them with the death rates from some of the commoner causes of death in this city. Thus during the past ten years:

Deaths from Typhoid Fever—have averaged	2	per	100,000
Deaths from Measles — " "	7	"	100,000
Deaths from Scarlet Fever — " "	2.5	"	100,000
Deaths from Diphtheria — " "	13.6	"	100,000

Of the 1,464 deaths, 655 occurred in urban districts and 809 in rural districts.

These are surprising figures. It is probable that much of the high fatality in rural districts is due to excessive speed and carelessness engendered by the feeling that driving in the open country is free from danger. The figures here presented should serve as a warning, and should lead drivers to exercise the same caution in driving in the country that they do when worming their way through crowded city streets.—*Weekly Bull.*, City of New York Dept. of Health, June 8, 1929.

Disposal of Phenol Wastes from By-Product Coke Plants*

F. W. SPERR, JR.

Director of Research, The Koppers Company, Pittsburgh, Pa.

THE growth of the by-product coke industry in the United States has been phenomenal. Fifteen years ago, 75 per cent of all the coke was manufactured by the old beehive oven method in which the by-products were entirely wasted. During the first 6 months of 1928, 90 per cent of the coke in this country was made in by-product ovens. In 1913, about 17,000,000 tons of coal were coked in by-product ovens in the United States. Then came the war, in which the vital necessity of coal by-products for national defense was so forcibly demonstrated and so quickly and actively recognized that in 1918, 37,000,000 tons of coal (more than double the annual amount just before the war) were coked in by-product ovens.

We have the largest by-product oven installation in the world at the plant of the Carnegie Steel Company at Clairton, Pa., coking about 10,500,000 tons of coal per year, or nearly as much as the total of all the by-product coke plants of the United States 15 years ago. The annual capacity of all the by-product coke ovens in this country is more than 85,000,000 net tons of coal.

The growth of this great, new national industry has had very little public notice. It is principally a servant of the iron and steel industry and the gas industry. Its products reach the public through secondary and tertiary agencies such as gas companies, coke dealers, chemical and pharmaceutical works, fertilizer manufacturers, motor fuel distributors, tar product companies and a great variety of others. Most of the manufactured gas used in the United States is produced either directly from by-product coke ovens or from coke made in these ovens.

THE PHENOL PROBLEM

The phenol problem as it exists today, and in so far as it may be caused by by-product coke plant wastes, has been created largely by the rapid growth of the industry and by the introduction of the chlorination of public water supplies.

* Excerpts from paper read before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928.

The first by-product coke plants that had to deal with the phenol problem were owned by iron and steel companies and produced substantially all of their coke for blast furnace purposes. Such plants could and did adopt the expedient of using the phenol wastes to quench the coke. The solution of the problem became much more difficult with the rapid introduction of plants for making domestic coke, for which the practice of quenching with phenol wastes is not feasible.

In considering the phenol problem as it exists today, from the standpoint of the by-product coke industry, it is important to consider the following points:

1. Although the individual plants are rather widely dispersed, most of them are so located as to affect three important drainage areas; thus, 35 per cent of the by-product coking capacity of the United States is located on the Ohio River drainage area; 16 per cent is located around the lower end of Lake Michigan; while 16 per cent drains into Lake Erie, chiefly near Cleveland and Buffalo.

2. Some other solution besides coke quenching must be found to solve the problem for those plants which sell their coke for domestic purposes.

It should be stated at this point that there is every reason to believe that the phenol problem has been solved so far as giving ample protection to the communities in the Ohio River drainage area is concerned. The solution, so far as this district is concerned, has been found almost entirely in the coke quenching method. Although this remedy has secured adequate protection to the public, it is not regarded as satisfactory so far as the industry is concerned, and a great deal of work has been done, and a great deal of money has been and is being spent to find some better method which will protect the public and which will have fewer technical disadvantages.

The extraordinary difficulty* of the phenol problem is proved by the enormous amount of work that has been done on it not only in the United States, but in England, Germany, and other countries. The problem is of serious concern in the crowded industrial districts of western Germany, and visits have been made to this country by many German engineers for the purpose of inspecting the methods that have been developed here. The present situation in America may be summed up by saying that public water supplies can now be adequately safeguarded by certain methods that have been developed. Although much remains to be done toward improving these methods and lowering their cost of application, there is every reason to believe that the problem will shortly be regarded as solved, not only from the standpoint of the public, but from the standpoint of the industry. All pos-

* This difficulty is emphasized in recent German technical literature on the subject. (See D. H. Wiegman, *Glückauf*, Mar. 31, 1928, p. 397.)

sible credit should be given to the very fine spirit of coöperation that has been displayed by the health departments of the different states affected. This coöperation has been responsible for the very rapid progress that has been made—a progress much more rapid than is generally realized and which would be greatly hampered in the absence of such coöperation.

OCCURRENCE OF PHENOL IN BY-PRODUCT COKE PLANT WASTES

In speaking of phenols from the standpoint of waste disposal, we refer to all chemical substances which give the so-called phenolic taste in chlorinated water. Thus, we mean not only phenol itself (C_6H_5OH) and the cresols and bodies of similar character, but also benzol and derivatives of benzol. All of these substances occur primarily in the gas and tar evolved when coal is coked in a by-product oven. Any water which comes in contact with such gas or tar will dissolve out a little of the phenols, and any water which comes in contact with the benzols in the benzol recovery apparatus will carry away enough of these to be objectionable. The sources of the phenols in by-product coke plant wastes are therefore as follows:

1. The gas liquor or weak ammonia liquor which has been condensed or scrubbed out of the gas in contact with tarry matter
2. The so-called final cooler water or water into which the gas has been brought directly in contact for cooling purposes
3. Steam condensate from the distillation apparatus in the benzol recovery plant and other water which has come in contact with benzol
4. Miscellaneous spillages and floor and ground drainage

ECONOMIC CONSIDERATIONS

There is apt to be very serious misconception as to the possible income that can be derived from the recovery of phenols from ammonia still waste. Many non-technical people, interested, as all of us should be, in the subject of stream pollution and having heard of the great values that have been found by some packing houses in the working up of what was formerly refuse, or by some chemical company in developing what was formerly a waste product, have hastily assumed that the same possibility applies to any plant waste.

Now the fact is that one of the serious difficulties of the problem is the very small quantity of phenols that can be recovered. With a phenol content of a little over 2 gm. per lit. of still waste, there will be about 0.5 lb. of phenols in the waste produced from one ton of coal. Most of the by-product coke plants that have to deal with this problem are of moderate size. The Clairton plant of the Carnegie Steel Company is in a class by itself and there are only a few plants handling

more than 3,000 tons of coal per day. The majority of by-product coke plants handle much less than this—1,000 tons per day would be a fairly typical figure. Such a plant would produce about 500 lb. of phenol per day in the ammonia still waste. The value of this is problematical. It should be remembered that it is crude phenol and would require certain refining to make it suitable for most purposes. Four cents per pound might be considered a possible value. At this price, if all the phenols in the still waste from a 1,000 ton plant could be recovered, they would have a value of $20 per day. This is a very slender margin for the operation of any process. The majority of by-product coke plants would be well satisfied if the income from any phenol recovery process would just balance the costs.

METHODS OF PHENOL RECOVERY OR ELIMINATION

A vast amount of experimental work has been done with the object of extracting and recovering the phenols in the gas liquor or ammonia still waste, or of eliminating or destroying it. In our laboratories, the reactions of the phenols with literally hundreds of substances have been examined under various conditions. There is always the possibility that some practical process may be discovered for the removal of the phenols by chemical reaction, but at present the most successful and the most promising processes are based on the employment of physical or biological means.

The processes which have reached large-scale operation may be classified as follows:

1. Disposal by Complete Evaporation:
   a. Evaporation of gas liquor
   b. Evaporation of still waste
      i. On hot coke
      ii. On blast furnace slag
2. Preheating Ammonia Liquor Entering the Ammonia Still
3. Extraction of Phenols with Solvents:
   a. Treatment of ammonia liquor with solvents
   b. Treatment of ammonia still waste with solvents
4. Removal of Phenols with Solid Adsorbents
5. Biological Treatment:
   a. By mixing with sanitary sewage
      i. Untreated sewage
      ii. Activated sludge process
      iii. Imhoff tank process
   b. Treatment on inoculated filters

In most cases, the plants producing phenol wastes are not conveniently located with respect to sewage disposal systems; but the bacterial method of phenol elimination may still be employed by re-

course to the so-called bacterial filters. These consist of beds of porous material—usually coke—inoculated with the phenol destroying bacteria by admixture with manure, sewage, activated sludge, Imhoff tank sludge, etc. The ammonia still waste must be clarified and diluted to such an extent that the bacterial action will not be inhibited or destroyed. A freshly inoculated bed appears to be quite sensitive to an excess of still waste; later, in some manner, the bacteria become more resistant toward the phenols and the proportion of still waste may be increased. The diluted still waste is sprinkled over the surface of the filters and percolates through the inoculated mass, which is preferably aerated.

The pioneer investigations of the treatment of ammonia still waste on bacterial filters were made by E. Frankland and H. Silvester[1] about 24 years ago. They studied the sewage disposal system of Oldbury, England, which consisted of large contact bacteria beds handling city sewage, with which was mixed as much as 9 per cent of ammonia still waste. Later, experimental bacterial filters were installed in England, Germany and America, for the direct purpose of ammonia still waste disposal. The Bradford Road Gas Works, Manchester, England, began using the bacterial filter for this purpose in 1908, and continued the practice for at least 6 years with apparent success, although in 1923 the process was still considered in the experimental stage in England, as shown by the extensive discussion in the *1923 Report of the Alkali Works Inspectors.*

Important work in the application of bacterial filters was done by Ralph L. Brown of The Koppers Company's Research Laboratories.[2] Brown found it desirable to mix humous material, such as peat, with the coke packing, and introduced the mechanical aeration of the filter bed. Instead of employing fresh water for dilution, he recirculated a requisite amount of the treated waste for this purpose. This recirculation is valuable in conserving the bacteria which otherwise would pass out of the system with the diluted waste. With this dilution by recirculation, the beds can be operated practically continuously, one apparatus on a laboratory scale functioning continuously for a year without change.

Present opinion in regard to the application of the bacterial filter under average American conditions is that it is too expensive in comparison with other methods for the elimination of the bulk of the phenols from ammonia still waste. It requires a large ground area (according to Brown, one cu. yd. of filter bed will handle 10 to 20 gal. of ammonia still waste per 24 hours) and the expense of installation is considerable. No bacterial filters have yet been installed on a large

scale in this country, and a single modern large-scale installation in the Emscher District in Germany has been found very expensive to operate. Experts, both in this country and in Germany, believe that the bacterial filter will find application in those cases where the bulk of the phenol is removed by some other method, where conditions make it absolutely necessary to eliminate the last traces of phenol, and where no sewage disposal plant is available for this purpose.

A process has recently been developed by The Koppers Company for the removal and recovery of the bulk of the phenols from the ammonia liquor in connection with the operation of the ammonia still. This is accomplished by taking the hot liquor from the bottom of the free section of the still and pumping this liquor over a scrubber through which a mixture of steam with air or other gas is circulated. The phenols pass into the hot gas and steam while the liquor runs back to the lime leg of the still. The mixture of gas and steam carrying the phenols is then treated in a second scrubber with a solution of caustic soda, which removes the phenols as sodium phenolates. The gas and steam mixture is then recirculated by means of a fan back to the first scrubber. The sodium phenolate is withdrawn from the second scrubber and treated in the usual manner for the recovery of the phenols.

This process, on a large experimental scale, has shown very high efficiency in the removal of the phenols; and in regular operation, over 95 per cent of the phenols are being eliminated. Two large plants are being constructed, one of which is just about to be put in operation at the present writing.

SUMMARY OF PRESENT STATUS OF PHENOL REMOVAL

The writer's personal view as to the application of the various methods that have been developed for the disposal of phenol wastes from by-product coke plants may be summarized as follows:

1. All phenol bearing wastes, with the exception of ammonia still waste, may be handled by installing suitable recirculating and intercepting systems so that no phenol from these sources need reach any public water supply.

2. The cheapest and most satisfactory method for ammonia still waste disposal consists in mixing the waste with ordinary city sewage, provided a sufficient amount of sewage is available.

   a. In cities having no sewage disposal systems, simple mixture with raw sewage will suffice to a certain extent, provided sufficient dilution or time of contact can be had. In these cases, it would be well to consider the installation of a sewage aeration system as this would greatly facilitate the destruction of the phenol.

   b. In cities using the activated sludge system of sewage disposal, a volume of still waste equivalent to 50 parts of phenols per million parts sewage

can be treated with certainty, and it is probable that a much larger proportion can be safely treated.

c. In cities equipped with Imhoff tank systems of sewage disposal, ammonia still waste properly clarified can be added either to the raw sewage or to the tank effluent; and if the effluent is suitably aerated, the phenols will be destroyed. We have not sufficient data as to the proportion of still waste that can be handled in this way, but it is probable that a proportion of 1 part still waste to 10 parts sewage may be safely handled, and Dr. Imhoff states that much higher proportions can be used.

3. Where the required amount of sewage is not available, the ammonia liquor should be treated for the removal of the bulk of the phenols; and this treatment should be followed, if necessary, by mixing the still waste, with its small remaining phenol content, with sewage, or treating it on bacterial filters. In most cases, the removal of the bulk of the phenol from the ammonia liquor will be sufficient without further treatment of the still waste.

4. The disposal of ammonia still waste by using it for coke quenching is available as an emergency method except for plants producing domestic coke; but although it offers adequate protection to water supplies, it is unsatisfactory for many technical reasons and will doubtless be superseded by other methods.

REFERENCES

1. *J. Soc. Chem. Ind.*, 1907, p. 231; *44th Alkali Report*, 1907, p. 49.
2. U. S. Patent 1,437,394, *Pub. Health Rep.*, 40, Sept. 25, 1925, pp. 2021–2026.

Regulations Governing Public Swimming Pools

THE following regulations governing public swimming pools were adopted at the regular monthly meeting of the Maryland State Board of Health held at the headquarters of the State Department of Health in Baltimore, June 18. The regulations became effective at once. They apply to any swimming pool used for a period of 6 days or longer and accommodating at any one time 10 or more persons.

1. No swimming pool shall be operated without a permit from the State Board of Health, or such local health authority as the State Board of Health may designate. Application for such permit shall be made in writing, upon forms provided by the Department of Health or the properly constituted local authority, stating the exact location of the existing or proposed pool, the approximate number of persons whom it is to serve, the proposed source of water supply, the methods of pool water purification to be employed and the sanitary conveniences to be provided. The form in each instance must be filled in sufficiently to constitute a complete description of the pool and the method of its operation.

2. Before the construction of any natatorium or swimming pool is begun, the plans and specifications for such structure shall be submitted to the State Department of Health or the properly constituted local authority for approval and a permit. The acceptance of a permit shall be construed to indicate that the applicant has read and accepted such rules of operation and maintenance as have been formulated by the State Department of Health under this regulation.

3. All bathing places shall be open for inspection by authorized health officials at all times when the place is in operation.

4. Health officers shall have the power to order reasonable changes relative to improving the operation and sanitary conditions of swimming pools and their surroundings, and, if deemed necessary, to close a pool until the conditions are approved by the State Department of Health.

5. All pools must be supplied with water which meets the minimum requirements of the State Board of Health.

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FEDERAL HEALTH CORRELATION

A NEW bill for the coördination of federal health activities was introduced into the 71st Congress on May 20, 1929, by Representative James S. Parker; and a companion measure was introduced by Senator Jones in the Senate as S. 1195. This new bill differs somewhat from that passed by the last Congress and vetoed by President Coolidge, but is the same in its essential particulars.

The new Parker Bill (now H. R. 3142) would empower the Secretary of the Treasury, when requested, to detail officers or employees of the U. S. Public Health Service to coöperate in the health work of any executive department or independent establishment. It would also allow the Surgeon General to detail personnel to educational and research institutions and to extend the facilities of the Service to outside scientists. The establishment of additional divisions in the Hygienic Laboratory for this purpose is also authorized.

A commissioned status for sanitary engineers, dental officers, and other non-medical scientific personnel is provided—the alleged unconstitutional features of the former bill in this respect having been surmounted by vesting the appointment solely in the President, with the advice and consent of the Senate. The number of such appointments is, however, restricted to not more than 110.

The Surgeon General is given the same rank as the Surgeon General of the Army, and a new rank of medical director is created to correspond to that of Assistant Surgeon General, though the latter title would be continued for chiefs of divisions. Promotion would hereafter be the same as in the Army Medical Corps.

No provision is made in this bill, as was in the former one, for a Nurse Corps in the U. S. Public Health Service. Authorization for expansion of the Hygienic Laboratory has also been omitted, as that

is taken care of in another bill, H. R. 3143, introduced by Mr. Parker, for a National Institute of Health. This is the same as the Ransdell Bill of the last session, which passed the Senate. Mr. Ransdell has reïntroduced it in the Senate as S. 1171.

The new Parker Bill provides for enlargement of the present advisory board of the Hygienic Laboratory into a National Advisory Health Council, with five additional members appointed from the public health profession.

This is, of course, an excellent piece of legislation, as was the other bill which was adopted, but vetoed on the advice of the former Director of the Budget. Both the director and his chief are now out of office and the bill has good prospects of becoming a law. Sanitarians can aid in the repassing of this valuable measure by communicating to their senators and representatives their wishes that it pass.

THE PROBLEMS OF BOTULISM

THE occurrence of an outbreak of botulism is still capable of exciting general interest in the causative food and other factors incident thereto. The original report of the California Botulism Commission[1] is now a number of years old. The facts elicited by this commission do not appear to have been generally followed by home canners, since outbreaks continue to occur. These outbreaks are usually accompanied by a serious case mortality rate, and an effort to reduce these preventable fatalities should be immediately made. The preservation of food by heat, as well as the newer methods by cold, is a technical procedure of the first magnitude. The chemical reaction of the food, the consistency of the product, the size of the container, the original soundness of the material, the cleanliness of the packer, and, finally, the source of the bacterial contaminant with its thermal death time and point, cultural and growth possibilities with the production of poisonous substances, all play their part. Therefore, the preservation of food cannot be legislated into safety, but the general public can be educated to accept and use approved methods.

Fortunately, many universities, notably, Harvard, Stanford, Chicago and California, have interested themselves to the end that many facts have been ascertained and applied to canning. Apparently, the greatest benefactors of this unheralded but remarkable research have been the commercial canners of foods. This is shown in the absence during the past few years of outbreaks of botulism due to commercially canned products.

Recently, the *Journal of the American Medical Association*[2] very rightly sounded a note of warning to the home canners because of con-

tinued outbreaks in various parts of the United States. The methods to be adopted to make home canning safe are problems that should be met. There is now available enough information to make a start at least to do this, and official governmental and health agencies should at once adopt a program. This program should primarily be educational. There should not be issued general orders of one type only to have them withdrawn because of subsequently proved impracticability. There appears to be no doubt that certain food products are ordinarily safe from visible spoilage yet may be toxic. Again, there are foods whose acidity would preclude bacterial growth in the majority of instances. Likewise, there may be added to many foods certain inhibitory substances like salts or acids that retard the growth of spores like *B. botulinus*. It is advisable that a committee of qualified persons be appointed to study and report on the safety of the preservation of food, particularly as now practiced in the home, and to lay plans for its future safety.

REFERENCES

1. Geiger, J. C., Dickson, E. C., and Meyer, K. F. The Epidemiology of Botulism, *Pub. Health Rep. 127*, Sept., 1922, 119 pp.
2. An Increase in Outbreaks of Botulism Due to Home Canned Products, *J. A. M. A.*, 92, 22: 1868 (June 1), 1929.

PROGRESS IN CANCER

WITHIN the last few years there has been a notable advance in our understanding of cancer—not that we are materially nearer a knowledge of the specific cause, if there be one, of that disease, if it be a disease; but there has been distinct progress in the recognition of cancer as a problem which must be attacked in a different way than has hitherto been thought necessary. Instead of being looked upon as a private matter between the patient and his physician, it is now regarded as a subject calling for community action.

Health departments no longer give attention to cancer merely as a detail of vital statistics and as a subject for occasional notice in their periodicals. Its inclusion in the *Appraisal Form*[1] means that from now on the adequacy of health programs will be judged in part by what is done in investigating the prevalence of cancer; in providing for the diagnosis of early and curable cases; and affording proper treatment for the sick, both as to medical attention and nursing.

The broad plan of attack which is being made by the Massachusetts Board of Public Health is being watched with the greatest interest, embodying as it does a definite and continuous campaign of public instruction and the maintenance of clinics in all parts of the state, not to speak of a special cancer hospital.

Within the last three years there have been two international cancer conferences, one in America to consider the practical applications which should be made of existing knowledge, and the other in London on the subject of research.

The literature devoted to cancer has increased enormously during the last five years, every conceivable aspect of the question receiving its share of attention. The daily press, instead of avoiding the subject, as was formerly customary, eagerly prints as news acceptable to its readers whatever appears authentic and of value. The publication of a series of sixteen informative articles without any news value whatever in over five hundred newspapers was a public service which was without precedent and is not likely soon to be repeated for any other cause.

Although there has been distinct progress in the recognition of cancer as a great social, medical and public health question, the scientific solution of its causation awaits further study. Research in many directions and by specially qualified persons is now being actively prosecuted all over the world. The expectation is not that a single and complete solution can be found for all the cancers which occur, since they appear in a great variety of forms and grades of malignancy, but it is believed that by separating cancers into small groups or studying them individually, the chain of events which leads up to the development of the cancer cell may eventually be worked out.

REFERENCE

1. *Appraisal Form for City Health Work* (3d ed.), 1929. American Public Health Association.

BOOK REVIEWS

REVIEWS of scientific books present one of the most difficult problems of an editor. There is an overwhelming deluge, and some publishers are very insistent in asking for reviews of those they send in. A good review is an advertising asset, and not many years ago certain publishers demanded favorable notices at the cost of cutting the journals from their free list. Happily there has come about a great change in this respect. While publishers of course wish favorable reviews, protests against unfavorable ones are not common—at least in our experience. In a recent article the well known editor of *Science*[1] tells of an instance in which the sales manager of a university press canceled advertising on account of a notice to which he took exception.

Many factors must be taken into consideration in the reviewing of books. The first is the selection of those which are suitable for, and

worthy of, review in the particular publication, this depending to a great extent on the character of the journal and the class of readers which it reaches. It goes without saying that considerable latitude is possible, since there is much overlapping. A scientific journal must at times consider even novels and popular books, either to commend them for general reading or to condemn their false teaching. Our JOURNAL must consider books which are of interest and value to its varied membership.

When a book has been selected, to whom shall the review be entrusted? Preferably to some specialist on the subject of which it treats. In general, this seems the wisest course, but at times leads to unfair or too exacting criticism. Unrequested reviews are apt to be favorable, written by some friend of the author, though they may also come from scientific adversaries. The great object of an editor must be to obtain a fair and impartial criticism, devoid of personalities, adhering closely to the material presented, taking into consideration the claims made by the author, and to some extent those of the publisher. It must always be remembered that reviews are useful to readers who may not have opportunities for the critical selection of their reading matter. Many buy their books on the strength of reviews in standard journals. Authors generally appreciate fair reviews, and consider the criticisms in the preparation of second editions.

The editor must always have in mind the reputation of his journal for accuracy and fairness. A favorable opinion of a poor book reacts upon a journal, through loss of confidence on the part of readers. The reviewer must always be accurate in his statements and able to back them up by quotations, with page and line. Reviews should stick to the subject matter of the book. Too many reviewers seize the opportunity to write essays on some individual fad. Such contributions are articles rather than reviews, and often have only a remote connection with the material submitted.

There is great diversity of opinion as to the value of book reviews. Some hold that they are of interest to only three parties—the author, publisher and reviewer; others, that the larger part of a journal should be devoted to reviews. Such opinions are reflected in the practices of different editors. In our own JOURNAL, as much space as possible will be given to reviews. Writers will be selected for their special qualifications, and are urged to remember that the essentials of a good review are honesty, knowledge of the subject, clarity of expression, and brevity.

REFERENCE

1. *Science*, Feb. 22, 1929, p. 220.

ASSOCIATION NEWS

58th Annual Meeting, A. P. H. A.
Minneapolis, September 30 - October 5
Registration Headquarters — Exhibit Hall, Minneapolis Auditorium

The Executive Board Proposes Association Changes

SHORTLY after the last Annual Meeting, the President of the A. P. H. A. requested the Committee on Cooperation, Development and Finance to study the services rendered by the Association to its members and to the cause of public health generally; to take stock of the effectiveness of its organization, and of its administrative and financial methods; and to devise ways and means of realizing the still undeveloped potentialities of the Association for fruitful activity. This organization like all others must be prepared for change and expansion to keep pace with scientific progress and the changing ideals in public health work. To achieve these purposes, the Committee on Coöperation, Development and Finance, with the approval of the President and with expert guidance, proceeded to analyze and study the Association.

In this effort the committee aimed to formulate proposals which would develop our activities in accordance with a carefully conceived, long-visioned and well-organized plan, which would simplify and strengthen our administrative machinery and would effect economies where possible, and at the same time define the responsibilities of our officers and the administrative staff in achieving our major objectives.

The facts and the observations that developed from these studies were embodied in large part in a report prepared by a consulting economist whom the committee had engaged to aid it. The following summarizes the chief disabilities which the studies of the committee revealed:

1. The Association has lacked financial resources to encompass the various enterprises which it has attempted to carry on.
2. Enterprises of importance have suffered because of a scattering of effort, time and money along too many lines.
3. Continuity in policy and in administration has frequently been lacking.
4. The executive as well as the administrative functions of the officers have not been clearly defined—as a result uncertainty and variation in performance have followed.
5. Clearly defined financial policies have been lacking. The financial methods of the Association have in important respects lacked effective organization.
6. In general, the value of the Association's service has been seriously impaired by various defects revealed by the committee's study. The objectives of the Association could not for these reasons be adequately achieved, and substantial financial and personal support is not likely to be secured until appropriate measures to remedy these deficiencies have been instituted.

On the basis of these findings certain proposals as to policies, organization, major activities and finances have been formulated. It has not been possible

to circularize all of our membership to acquaint them with these findings and proposals and to profit by their experience and suggestions, because of the costs involved and the necessity for prompt action. The Executive Board was therefore constrained to content itself with the counsel of a necessarily limited number of Fellows with whom contact could more readily be made, before publishing these proposals.

In offering the suggested changes, the Executive Board is mindful of the many excellent features in our present organization which it has sought to retain. It has also been studious to avoid modifications except where they would be likely to serve valuable purposes. Within the limits of space here available it is impossible to set forth the many considerations and reasons that have led to the conclusions upon which these changes are based.

In general the primary aim in these recommendations is to establish continuity in the government of the Association and to strengthen the executive and administrative services. In addition, such revisions have been designed to add to our existing governmental machinery the agencies and the personnel which could best formulate and execute comprehensive and sustained activities.

To effect these purposes, the Executive Board proposes certain necessary changes in our Constitution and By-laws which are here grouped under 4 headings:

1. General administrative organization
2. Major objectives and machinery for their development
3. Executive organization
4. Changes in Section organization

I. GENERAL ADMINISTRATIVE ORGANIZATION

A. *Officers*—To remedy the lack of continuity in administration, it is proposed that the Association elect annually a President-elect, who shall be a member of the Executive Board and in intimate contact with the affairs of the Association. In place of the Executive Secretary, it is proposed that a Fellow shall be elected to serve as Secretary of the Association with such clerical aid and assistance from our employed staff as he may require. The duties of the various elected officers are to be more specifically defined in the Constitution and By-laws in order to fix responsibility and to mark the bounds of authority.

B. *The Governing Council*—The functions of the Governing Council are to be as follows:

1. To establish policies for the Association and for the guidance of the Executive Board and the officers.
2. To establish Sections of the Association; to combine or discontinue them when necessary; to maintain coördination among them; and to formulate general rules governing the policies of the Sections.
3. To submit to the vote of the Association all resolutions which have received the approval of the Governing Council.
4. To elect and establish qualifications for Affiliated Societies, Fellows, Honorary Fellows and Members as provided in the By-laws.
5. To elect the Executive Board and the officers of the Association.
6. To receive from the Executive Board at its first session, at the time and place of the Annual Meeting of the Association, a definitely formulated statement of a program of major activities proposed for the ensuing year. At the Annual Meeting of the Association the Governing Council shall determine in general outline the allocation of Association moneys in the budget for the ensuing year. It shall require a report from the Chairman of the Executive Board in which the work, the accomplishments and the financial status of the Association during the year preceding such Annual Meeting shall be reviewed.
7. To publish after each of its meetings an abstract of the minutes of such meetings.

The purpose of the requirement that the Governing Council publish minutes in abstract form of all of its meetings is to acquaint the membership at large with its activities.

Inasmuch as it is desirable to provide

for as democratic and as equitably apportioned representation on the Governing Council as possible, it is recommended that the members at large to be elected each year to the Governing Council shall be nominated by a Nominating Committee which shall consist of one Fellow elected by each section, and an eleventh one designated by the Executive Board, all of whom shall be designated at the preceding Annual Meeting. It should be clearly noted in this connection that this recommendation does not abolish the present provision in the Constitution and By-laws making it possible for any twenty-five Fellows to make nominations for membership on the Governing Council.

In view of the fact that membership on the Governing Council should have great significance, the Executive Board decided to hold a referendum to ascertain from the Fellows of the Association the conditions under which an Affiliated Society may be privileged to be represented on the Governing Council. It has been contended that those Affiliated Societies that are well organized and a source of strength and support to the American Public Health Association should logically be thus represented. On the other hand, certain health associations which may now or in the future be affiliated may lack such elements of strength, and therefore the question arises whether they should exercise voting power. The referendum will in due time be held and the question will be more adequately presented.

C. *The Executive Board*—The Executive Board shall be composed of four Fellows to be elected by the Governing Council for terms of five years each. In the beginning, one shall be elected for a term of one year, one for two years, one for three years, and one for four years, and thereafter one shall go out of office each year. These elected members shall be past or present members of the Governing Council. The Executive Board shall in addition comprise the President, the President-elect, the retiring President, the Treasurer, and the Secretary, as members ex-officio with full voting power.

The Executive Board shall elect its own chairman, and he shall hold office for not more than three years, and not be reëlected after such tenure of office until one year has elapsed. He shall have authority to appoint all committees of the Association, subject to approval by the Executive Board. He shall be a member of the Governing Council. These proposals, also, are designed to fix responsibility more definitely and to centralize administrative control.

The proposed duties of the Executive Board shall be as follows:

1. To direct the administrative work of the Association.
2. To act as Trustee of the Association's properties.
3. To plan methods for the procurement of funds.
4. To recommend budgets for the Association's work.
5. To conform to the policies of the Governing Council in the conduct of its work.
6. To approve the appointment of committees by its chairman.
7. To transmit a report of its proceedings and transactions to the Governing Council at least thirty days before each Annual Meeting.
8. To ratify the appointments and changes in the employed staff of the Association.

II. MAJOR OBJECTIVES AND MACHINERY FOR THEIR DEVELOPMENT

In order to focus clearly upon the major objectives of the Association and to create machinery for their more comprehensive development, it is recommended that the fourscore existing committees be discontinued. Where definite commitments have already been made, however, with respect to special projects, the Executive Board is to carry out such commitments in a way that will best harmonize with the general scheme of organization herein proposed.

The Executive Board is reasonably

confident that all of the major objectives of the Association can be effectively centralized in four standing committees. It feels convinced that all committee activities will find a logical and effective place under one of these four standing committees. Any special committees that may be required to carry on important services of the Association can be constituted as subcommittees of one of the standing committees. The functions and composition of these four standing committees are briefly stated in the following:

A. *Committee on Administrative Practice*—The size, the composition and the employed personnel of this committee are to remain unchanged, so as to carry out commitments already made.

B. *Committee on Meetings and Publications*—The scientific transactions at our Annual Meetings form the largest and most substantial contribution to our publications. Furthermore, the major activities of the Association and its members would profit most if the plans and the conduct of the Annual Meeting were in the hands of a standing committee which would correlate the program of the Annual Meeting with the publication work of the Association. To this end a committee to be known as the Committee on Meetings and Publications shall be appointed to consist of five members serving for terms of five years each; in the beginning one shall go out of office at the end of one year, one at the end of two years, one at the end of three years, and one at the end of four years, and thereafter one shall go out of office each year. After serving for two consecutive terms a member shall not be eligible for reëlection until one year has elapsed.

C. *Committee on Research and Standards*—The Committee on Research and Standards should be responsible for carrying out research in relation to the development of standards in important branches of public health work and coördinating such research and standardization in a manner that will not conflict with the functions of the Committee on Administrative Practice. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council. This committee shall also be charged with the duty of reviewing from time to time standards already established, so that they will be made to harmonize with current theory and practice. This committee shall consist of fifteen members representative of the various points of view in public health practice, appointed for three year terms, one-third the total membership expiring annually. After serving for two consecutive terms a member shall not be eligible for reëlection until one year has elapsed.

D. *Committee on Fellowship and Membership*—This committee shall pass upon the eligibility of Fellows and Members; it shall carry on membership promotion and recommend action to the Executive Board to suspend or drop Fellows and members for nonpayment of dues. The committee should consist of ten Fellows, one to be chosen by each section and to serve for a term of two years. In the beginning, the Executive Board shall designate the five members who shall serve one year. An eleventh member shall be designated by the Executive Board to serve for two years. After serving for two consecutive terms a member shall not be eligible for reëlection until one year has elapsed.

The programs and policies and special activities formulated and directed by the above named standing committees should be carried out by salaried secretaries employed for the purpose.

The Executive Board cannot too emphatically record its judgment based on the studies that have been made, that no project should be included in the program of activities for a given year unless such project has been formally approved by the Governing Council. It also seeks to establish it as a principle of action that the Executive Board shall prepare and submit a tentative program of activities and a tentative budget for the next ensuing year, and that such program of activities and budget shall be acted upon by the Governing Council at the Annual Meeting, at which time the latter will determine in general outline the allocation of Association moneys in the budget for the ensuing year. A further principle of action which the Executive Board would recommend to future Executive Boards and Governing Councils would be to withhold from submitting or approving a program for which financial support is not reasonably assured.

III. EXECUTIVE ORGANIZATION

It is recommended that the title of the Executive Secretary shall be changed to Executive Director, or to some other designation which will more accurately indicate his actual position and duties in the Association.

As a result of these studies certain changes have already been effected in the auditing service, and in relation to office management. The more substantial changes that have been found necessary are under consideration and will be referred to the succeeding Executive Board for final decision.

The management of the finances and the financial policy of the Association were made the subject of very careful study. Changes have been inaugurated and will be further developed to bring our financial methods into harmony with current business practice.

IV. CHANGES IN SECTION ORGANIZATION

To overcome certain disabilities in the organization and functions of the section councils and better to define their duties and responsibilities, it is recommended that section councils shall each consist of five members elected by the section for terms of five years each; in the beginning one shall serve for one year, one for two years, one for three years and one for four years, and thereafter one shall go out of office each year. This will assure continuity in planning the activities and in shaping the policies of the respective sections.

In view of the fact that section constitutions and by-laws have not been generally adopted, nor in effect where adopted, it is deemed necessary in the best interests of simple and effective organization to eliminate section constitutions and by-laws.

It is recommended that each section council shall elect its own council chairman and such other council officers as it deems necessary, and the duties of the section council are as follows:

1. To recommend papers, and to make general recommendations in relation to the Annual Meeting program.
2. To advise on section membership.
3. To advise on section policies.
4. To submit annually to the Governing Council through the Executive Board a report of the transactions of the section.
5. To report annually to the Governing Council through the Executive Board on the plans, scope and policy of the section during the succeeding year.
6. To formulate rules of procedure for the section.
7. To approve and transmit to the Governing Council resolutions originating in the section.
8. To advise on the publication of papers and reports presented at the section meetings.
9. To advise with respect to the appointment of technical committees, sub-committees or section representatives on special committees of the Association.

It is understood that the election of section officers, namely chairman, vice-chairman, and secretary of the section, shall go on as at present.

It is recommended that the Constitution and By-laws be amended to require that every Fellow or Member shall consummate affiliation with some section in the Association within twelve months after election to such Fellowship or Membership. A Fellow or Member failing so to affiliate shall be placed in an appropriate section by the Executive Board.

The Executive Board submits the results of its labors and deliberations in the hope that those of our Fellows and Members who have constructive suggestions to offer will do so at once, and that all will coöperate in giving effect to the substantial features of the proposed plan of reorganization.

PROPOSED CONSTITUTIONAL AMENDMENTS

In accordance with the provision of the Constitution, notice is hereby given of the following proposed amendments to the Constitution, which, if approved by the Governing Council, will be voted on at the Minneapolis meeting.

ARTICLE III, *Section A,* Paragraph 4.

Now reads:

A representative to be appointed by each affiliated society to serve for one year. Such representative shall be at the time of his appointment a Fellow of the American Public Health Association.

To be amended as follows:

Representatives to be appointed by Affiliated Societies as provided for in the By-laws. Such representatives shall be Fellows of the American Public Health Association.

ARTICLE III, *Section E,* Paragraph 4.

Now reads:

To elect Affiliated Societies, Fellows and Honorary Fellows as provided in the By-laws.

To be amended as follows:

To elect and establish qualifications for Affiliated Societies, Fellows and Honorary Fellows as provided in the By-laws.

ARTICLE III, *Section E,* Paragraph 6.

Now reads:

To receive from the President, on behalf of the Executive Board, a report of the meetings, policies and work of the Executive Board; a report from the Executive Secretary concerning the administrative work of the year; and a report from the Treasurer concerning the finances of the Association.

To be amended as follows:

To receive from the Executive Board at its first session, at the time and place of the Annual Meeting of the Association, a definitely formulated statement of a program of the major activities proposed for the ensuing year. At the Annual Meeting of the Association the Governing Council shall determine in general outline the allocation of Association moneys in the budget for the ensuing year. It shall require a report from the Chairman of the Executive Board in which the work, the accomplishments and the financial status of the Association during the year preceding such Annual Meeting shall be reviewed.

Add:

7. To publish after each of its meetings an abstract of the minutes of such meetings.

ARTICLE III, *Section G.*

Omit the word "Executive."

ARTICLE IV.

Now reads:

The officers of this Association shall be a President, three Vice-Presidents, an Executive Secretary and a Treasurer. The officers, with the exception of the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. Officers shall serve from the close of the Annual Meeting when elected, until the close of the next Annual Meeting, and until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Executive Secretary shall be elected by and serve at the pleasure of the Executive Board.

To be amended as follows:

The officers of this Association shall be a President, a President-elect, three Vice-Presidents, a Secretary, a Treasurer and the Chairman of the Executive Board. The officers, with the exception of the Chairman of the Executive Board, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. Officers shall serve from the close of the Annual Meeting when elected, until the close of the next Annual Meeting, and until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Chairman of the Executive Board shall be elected by the Executive Board.

ARTICLE V.

Substitute word "Fellows" for "Members."

APPLICANTS FOR FELLOWSHIP

LABORATORY SECTION: George F. Reddish, Ph.D., Washington, D. C.

HEALTH OFFICERS SECTION: Henry L. Akridge, M.D., Brunswick, Ga.; George H. Bigelow, M.D., Boston, Mass.; William C. Blake, M.D., Princeton, N. J.; Lester Van D. Chandler, Hackensack, N. J.; Warren F. Draper, M.D., Washington, D. C.; Charles H. Kibbey, M.D., Fairfield, Ala.; Burton K. Kilbourne, M.D., Fargo, N. D.; George Parrish, M.D., Los Angeles, Calif.; Charles W. Strowger, M.D., New Orleans, La.

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Harriet F. Young, R.N., B.S., Wilkes-Barre, Pa., Executive Director, Visiting Nurse Association

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Charles W. Bartlett, M.D., Tampa, Fla., Elected Member 1928

William J. Fleming, M.D., Troy, N. Y., Elected Member 1928

Lockhart Nelson, Hillsboro, O., Elected Member 1928

Chandler P. Robbins, M.D., Columbus, O., Elected Member 1925

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Reporting of Venereal Disease in Michigan—[In keeping with our policy of endeavoring to make this section a forum for Health Administrators, Don M. Griswold, M.D., D.P.H., Deputy Commissioner of the Michigan State Health Department, has favored us with a statement regarding the policy of his department with respect to the reporting of venereal diseases. This statement was written in response to one of the numerous inquiries received at Dr. Griswold's office but should prove of interest to all readers of the Journal.—Editor.]

All positive laboratory reports are presented not only to the physician but to our Bureau of Records and Statistics. These are checked against reported cases. If the case is not reported in a reasonable length of time, it is made a subject for query.

We keep in close touch with clinics, hospital services and other organizations caring for these patients. If we can find occasion to call their attention at least once a month to the fact that they are amiss in reporting, it serves to keep them alert.

Our reporting system:

(a) Our blanks require cases to be reported directly to the Michigan Department of Health, giving the name, street, and number. We have ceased emphasizing the venereal aspects of the diseases and are emphasizing their contagiousness and the fact that the greatest thing that a public health agency can do is to reduce the time of infectiousness. By doing away with many of the war-time procedures which only indirectly bear on the problem, and by concentrating on the parts of the program that are effective and have a direct bearing on the people, we are making progress. We believe that cases should be reported by name and address. I have heard health officers argue for hours that the number of the patient is as much good as the name. I can only say for these men that they are piling up administrative difficulties for themselves and making it much harder to accomplish the few simple things that we know are effective. I do not believe it is good administrative policy to make work harder, and we always strive to make it easier. Our cases are, therefore, reported by name and address.

(b) Is the question "Is this patient now under treatment with you?" important?

If this question is answered "yes," we feel that all that can be done is being done to make this patient non-infectious at the earliest possible moment. If this patient does not continue treatment with the physician until he is non-infectious, this fact must be reported to the Michigan Department of Health. When such report is received and an inspector calls on the individual and requires that he go under treatment at once, usually he claims that he had merely changed his physician. We cannot designate the doctor, but the patient must be under medical care if he is to be free from the houndings of our inspector.

If the above question is answered "no," the inspector calls on the individual and takes him to a physician where he will receive adequate treatment.

(c) The source of infection is also required to be given by name and address. If the source is under treatment with the same doctor as the orig-

inal case, he usually designates this fact. We then have an inspector call on this person and explain that he has not been following the doctor's advice with regard to preventing the spread of infection to others and that this constitutes a penitentiary offense in this state. If we are satisfied that this advice is sufficient it is left as a warning. If it appears that it is not sufficient, we take him to court and send him to a penal institution where he will receive proper attention.

If the source is not under treatment with the doctor who reports the original case, we go over our records to see if the case was reported by some other doctor. If it is found to have been reported, we proceed as above. If it is found not to have been reported, the inspector calls on the person to inquire into the facts of the case. The state law gives us the right to make examinations of persons that are "reasonably suspected" of having a venereal disease. Our position is that if a report reaches us as described above, that constitutes sufficient grounds to be "reasonably suspected."

If after this examination the physician will certify to the fact that the patient is non-infectious, we can go no further. If he finds laboratory or clinical evidence of the case being infectious, we require the person to place himself under treatment at once.

You can see from this that our efforts are directed toward placing venereally infected persons under treatment. This is the best way, of which we have knowledge, to render them non-infectious at the earliest possible moment. This wins for us the approval of the medical profession, who give their coöperation in the matter of case reporting. It frequently happens that a physician will report a case of venereal disease, and by using his ingenuity, will get the name and address of the source. Our inspector will call on the source and, if clinical examination is indicated, will bring the source of infection to the doctor's office for examination. Thus, the doctor has tangible evidence that we are coöperating with him. We can be of service to him, and he can be of service to us. To bring to the doctor the case needing treatment is far better pay for case reporting than would be the taking of 10 or 25 cents out of the state treasury for such report.

Use of Tabulator in Syracuse—[I. F. Thompson, M.D., has been good enough to send the Editor a statement concerning the use of the tabulator employed by him and Dr. Ruhland. This tabulator is a simple device which gives a ready method of finding the total amount of work performed.—Editor.]

Record forms have been planned for the Visiting Nurse Association and the School Health Service of Syracuse and both are using the tabulator to their entire satisfaction. The usual records can be planned for the use of such an aid. The principle is that of the "visible index." In this instance, the total of the day's work performed appears as the "visible index." The routine of operation is as follows:

In the Nursing Division of the Health Department and Visiting Nurse Association the daily reports are made out by the nurse and then given to the station supervisor for her information and checking. After the report is corrected, it is filed under the nurse's name. Shortly after the end of the month, when all the daily reports have been received, all the reports of an individual nurse for the month are placed in the tabulator and the columns added. A blank daily report is placed at the bottom of the tabulator on which is entered the totals of the nurses' work for the month. The tabulator should have as many leaves as there are working days in the month. After the totals for each nurse have been made, then

the sheets bearing the totals are placed in the tabulator and the total activities of the nursing staff are secured in one addition. These totals could be made at the end of each week, if desired.

What is saved by this method of procedure? In making up a bureau report under ordinary methods it is necessary to transcribe to a nurse's monthly report her activities for each day. At the end of the month, the monthly summary is made for each nurse. It is then necessary to transcribe each monthly summary to a summary for the department, then add, to obtain the total for the entire bureau. By means of the tabulator, there is no transcribing. The original figures are added to obtain the total for the individual nurse and that total is added to obtain the total for the bureau.

We believe it is a labor saver. Reports from the Visiting Nurse Association show that while they have doubled their staff and have more than doubled their work, the one clerk is able to get out her monthly report in less time than before they adopted this method.

LABORATORY

C. C. YOUNG

THE DETERIORATION OF IODIZED SALT

M. STARR NICHOLS, PH. D., FELLOW A. P. H. A.

Chemist, State Laboratory of Hygiene, University of Wisconsin, Madison, Wis.

SINCE iodized salt has been advocated and recommended quite generally by health officials and health boards as a means of supplying the deficiency of that element in the diet, it was thought advisable to ascertain if the quantity of iodide added remained under ordinary conditions of handling and sale of the article.

The samples were purchased in the open market. There were no means of determining how long the iodide had been mixed with the salt but a statement was given by the wholesaler or retailer of his opinion as to the age of the salt. The answers showed the samples to be from 1 to 4 months old at the time of purchase. Analyses were not made until 6 months after collection, so that the uncertainty as to age would be somewhat compensated for.

Twenty-six months from the time of the first analyses the iodide was again determined. If we consider the average age as 9 months at the time of the first analyses, and 35 months at the time of the second, we should be near the truth for estimation of deterioration.

Determination of the quantity of iodide present was carried out by the method of Kelly and Husband,[1] which is a slight modification of that of Kendall.[2] In applying this method it was found satisfactory to omit the first part of the procedure, which was intended for use when organic matter was present.

METHOD

Ten grams of the salt were placed in a Kjeldahl flask and 400 c.c. of water added. After solution, 3 c.c. of syrupy phosphoric acid and 6 drops of bromine were added. The flask was agitated to dissolve enough of the bromine so that the solution took on a deep yellow to brownish color. This treatment oxi-

TABLE I

AMOUNT OF IODIDE IN IODIZED TABLE SALT

Sample Designation	Amount of Sodium or Potassium Iodide Claimed Per Cent	Amount Found After 9 Months Per Cent	Loss First Period Per Cent	Amount Found After 35 Months Per Cent	Loss Second Period Per Cent
A	0.05	0.034	32.	0.029	15.
B	0.02	0.017	15.	0.016	6.
C	0.02	0.013	35.	0.015	—
D	0.02	0.026	—	0.016	38.
E	0.023	0.0105	54.	0.010	4.
F	0.02	0.008	60.	0.008	0
G	0.02	0.011	45.	0.0077	31.
EE *	0.023	0.015	35.	0.015	0
H	0.0222	0.017	23.	0.0008	95.
EEE	0.023	0.018	22.	0.015	16.
AA	0.05	0.042	8.	0.039	7.
FF	0.02	0.029	—	0.029	0
EEEE	0.023	0.008	65.	0.01	—
K	0.02	0.0012	94.	0.00	100.

* Samples with more than one letter indicate same brand purchased at different localities.

dizes the iodide present to iodate. After a few moments the flask was placed on the Kjeldahl burner, connected with the gas exhaust, and the solution boiled until there was no noticeable trace of bromine left. This usually required the loss of approximately 100 c.c. of water. To make sure that all the bromine had been expelled, a pinch of salicylic acid was added to the flask to offer combination to any trace of bromine which might remain. The flask containing the iodate in solution was cooled to room temperature, 0.25 to 0.5 gm. of potassium iodide dissolved in 5 c.c. of water was added and the resulting iodine titrated with N/200 sodium thiosulfate solution made freshly from a N/40 carefully standardized solution. The end point was accentuated by the usual starch indicator solution.

The iodide present in the salt was then calculated by the following relation:

$$\frac{\text{c.c. thiosulfate used} \times .0009301}{6} = \text{Potassium Iodide present in sample taken}$$

This method permits the estimation of minute quantities of iodides or iodine because 6 times as much iodine is titrated as was originally present in the substance analyzed.

To make sure that the large amount of sodium chloride would not interfere with estimation of the small amount of iodide, salt containing a known amount of iodide was analyzed. Four duplicate determinations were made, adding 0.005 gm. of potassium iodide to 10 gm. of iodide free salt. These gave 0.00502, 0.00503, 0.00502 and 0.005 gm. respectively.

DISCUSSION

The results show considerable loss during the first period of storage and a corresponding decrease thereafter. These first losses may, however, be only apparent as no attempt was made to check the accuracy of the manufacturer's statement of iodide content. Johnson and Herrington [3] consider that

sunlight and heat accelerate the deterioration, and individual samples before collection may have been kept under unlike conditions. Von Fellenberg [4] states that potassium carbonate does not affect the loss. After collection our samples were kept on the chemical shelves of the laboratory away from heat and sunlight and at room temperature. After 35 months' storage it will be noted that samples H and K had lost practically all their iodide.

Manufacturers of C, G and K stated that 1 per cent of calcium phosphate had been added. Samples A, E, H and AA contained 1 per cent calcium phosphate + 1 per cent sodium bicarbonate, and with the exception of sample H these samples did not deteriorate appreciably.

Other antihardeners used were magnesium and calcium carbonates. No definite relationship was established between these added materials and the keeping qualities.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Pulmonary Tuberculosis among the Insured—An analysis was made of 1,000 deaths from pulmonary tuberculosis among insured policy holders. The material for this study was taken from the files of the Pacific Mutual Life Insurance Company of California. The data compiled represent the findings in the medical examiners' reports at the time insurance was issued, the Disability Claim file, and the Death Record. A 15-year period of time is covered extending from 1913 to 1928. The average time that elapsed from the date of application to the beginning of illness was 4 years. The disability covered an average period of 2 years and 3 months. The average life policy was between 7 and 8 years. For one-third of the policies it was 5 years or less; for one-third 5 to 10 years; and for one-third over 10 years. There was an average age of 32 years at the time of application, and at the beginning of illness the age was approximately 35 years. The average age of death was between 38 and 40 years. Underweight occurred among 761 of the cases. Two hundred were 5 per cent underweight; 246 were 10 per cent underweight; and 127 were 20 per cent or more underweight. Two hundred and thirty-nine of the cases were overweight. There was a family history of tuberculosis in 7.4 per cent of the underweights and 8.7 per cent of the overweights. Low blood pressure was found in 3.2 per cent of the underweights and 2.1 per cent of the overweights. A history of influenza was found in 11 per cent of the underweights and 5.9 per cent of the overweights, and a history of common colds was found in 5.4 per cent of the underweights and 6.2 per cent of the overweights. A history of lymph-node enlargement was found in only 2 cases.

A study of the data suggests that

underweight is the factor which most clearly indicates a bad prognosis. A family history of tuberculosis associated with underweight is of less importance than is generally assumed. This conclusion is drawn from the fact that there was a positive family history in just as high a percentage of overweights as in underweights. A personal history of upper respiratory disease is a common finding, and of importance especially if the condition is chronic or recurrent. Low blood pressure is not of vital prognostic significance.—L. H. Lee. An Analysis of 1,000 Deaths from Pulmonary Tuberculosis among Insured Policyholders, *Am. Rev. Tuberc.*, 19: 412 (Apr.), 1929.

Diphtheria Mortality in Large Cities of the United States in 1928—A survey of diphtheria deaths in 81 cities of more than 100,000 population shows that 11 cities had mortality rates of less than 2.0 per 100,000 population in 1928. Two cities, Grand Rapids and Tacoma, had no diphtheria deaths during 1928. Tacoma was among the 10 cities with highest diphtheria deaths in 1925 and 1926, and Grand Rapids among the 10 cities with highest 1920–1923 averages. Of the other 11 cities, Des Moines had a rate of 0.6, Erie a rate of 0.7, Seattle a rate of 1.0 and Utica a rate of 1.0. Rates of 10.0 and over occurred in 21 cities in 1928, as against 31 in 1927. In 1928 there was only 1 city, Newark, which had a diphtheria death rate of 20.0, whereas in 1927 there were 2 such cities. Among the eight geographic divisions, the East North Central group of cities had the highest death rate of 11.3, and the Mountain and Pacific group had the lowest rate of 4.7.

Of the 12 New England cities, the Fall River diphtheria death rate showed a striking decrease from 14.3 in 1927 to 3.0 in 1928, the Lynn rate decreased from 19.1 to 6.6, and the New Bedford rate decreased from 15.6 to 9.0. In the Middle Atlantic group the rate for Utica fell from 22.6 in 1926 and 29.2 in 1927 to 1.0 in 1928. In the South Atlantic cities Jacksonville and Baltimore had decreases from 7.2 to 3.5, and from 11.3 to 7.6, respectively. In the East North Central group the largest increase was shown in Akron, where the 1928 rate was 12.4, as against the 1927 rate of 5.2. Three of the 4 East South Central cities had lower diphtheria death rates in 1928 than in 1927. Nashville was the only city with a rate above 10.0. Five of the 8 cities in the West South Central group showed 1928 rates that were smaller than the 1927 rates. The most conspicuous of the decreases were in Fort Worth and New Orleans where the rates decreased from 15.3 to 5.9, and from 15.1 to 8.6, respectively. In the Mountain and Pacific group, Salt Lake City showed a decrease in the diphtheria death rate from 14.0 in 1927 to 5.1 in 1928, and Tacoma, a decrease from 4.7 in 1927 to 0.0 in 1928.—*J. A. M. A.*, 92: 1759–1762 (May 25), 1929.

Typhoid Fever in Large Cities of the United States in 1928—The seventeenth annual report of the *Journal of the American Medical Association,* concerning typhoid fever in 81 cities, has been published. Nine of the 81 cities concerned in this study had no typhoid deaths during 1928. Of these 9 cities, 4 had similar records once before, and another, Yonkers, 4 times before. Twenty-five of the cities had death rates below 1.0 per 100,000 population, as against 20 in 1927. There were only 4 cities with death rates over 10.0 per 100,000.

Four of the 12 New England cities had no typhoid deaths during 1928. This is the largest number of cities in a single group ever to make such a record. For New Haven and Spring-

field it was the second successive year. The rate of 0.6 for Boston was the lowest ever recorded for that city. Fall River with a death rate of 4.5 had the highest in the New England group for 1928, and showed an increase over the 1927 rate of 2.3. In the Middle Atlantic group there were 2 cities, Elizabeth and Yonkers, with no typhoid deaths. The rate of 0.8 for Philadelphia was the lowest in its history. Atlanta in the South Atlantic group had a death rate below 10.0 for the first time since 1919, when its rate was 9.6. Its 1928 rate was 7.4 as compared with 14.0 in 1927.

In the East North Central group, Chicago lowered the 1927 death rate of 0.7 to 0.5, this being its third successive year with a rate below 1.0. Cleveland and Detroit had rates of 0.6 and 1.0 respectively, as compared with 1.0 and 1.2 for 1927. In the East South Central cities, the reductions in Birmingham and Memphis are especially notable. Birmingham's rate declined from 12.9 in 1927 to 7.2 in 1928, and that of Memphis from 14.5 in 1927 to 11.6 in 1928. Among the West North Central cities Duluth had no typhoid deaths. In the West South Central group, 4 of the 8 cities had lower rates in 1928 than in 1927. Tulsa had a rate of 3.5 in 1928, as against 8.7 in 1927, and San Antonio had a rate of 2.3, as against 5.7 in 1927. Tacoma, which stood at the foot of the Mountain and Pacific cities in 1927, and next to the foot in 1926, headed the list in 1928 with a record of no typhoid deaths. This is the second city in the group ever to attain this distinction.—*J. A. M. A.*, 92: 1674–1677 (May 18), 1929.

Measurements of Female Students—This study includes the measurements on 1,022 women entering the University of Minnesota during the school year 1925–1926. The average age was 19.6 years. The average height, 1,617 mm., was above that reported for the women in all American colleges, excepting Stanford, Smith and Vassar. Minnesota women averaged 128 mm. less in height than the men students, but there was no significant difference in variability. The average body weight of the Minnesota women was 54.37 kg., and the coefficient of variation was higher than in the men. In body build the Minnesota women averaged relatively more slender than any other American college group, excepting Oberlin and Nebraska. The average chest expansion was 63.42, as compared with 74 mm. for the men. The vital capacity in the Minnesota women averaged 2,888 c.c., which is above the averages for American college women, excepting Vassar and the groups of nurses. There was a marked sex difference, the vital capacity of the men averaging decidedly higher, even for the same stature and weight.

The correlation of stature with age was insignificant in the group. The normal increase of height with age up to about 20 years fails to occur, probably because those entering at the earlier ages are precocious physically as well as mentally. The correlation coefficient between stature and sitting height was 0.690; that between stature and weight, 0.451; and that between stature and chest girth, 0.254. The correlation between body weight and age in this group was low, there being only a slight tendency for increase of weight with age. The correlations between body build and age, pulse rate, and chest expansion are practically insignificant. The correlation with sitting height was low, while that of 0.672 with chest girth was high. These correlations are similar to those found in the Minnesota men. Vital capacity tends to decrease with age, showing a small negative correlation. The small correlation of 0.120 between vital capacity and chest expansion indicates

that in the women, even more than in the men, chest expansion is a very poor index of vital capacity.—C. M. Jackson. Physical Measurements of the Female Students at the University of Minnesota, with Special Reference to Body Build and Vital Capacity, *Am. J. Phys. Anthrop.*, 12: 363–411 (Jan.–Mar.), 1929.

Prophylaxis of Respiratory Disease with Vaccine—In an industrial plant employing 5,000 men, respiratory diseases caused 34 per cent of all cases of disabling illness, and 35 per cent of all time lost from sickness disability during the past 5 years. Vaccine therapy seemed to offer the most promising means of reducing the respiratory disease incidence. Treatments were given in October and November, 1927, and the results recorded on April 1, 1928. Of 382 cases given preventive vaccine treatment for colds, 68 per cent were benefitted. In two groups of apparently equal susceptibility, 30 per cent of the vaccinated group lost time from respiratory disease as against 49 per cent of the non-vaccinated group. Twelve cases of pneumonia occurred among the non-vaccinated employees and none among the vaccinated group. Sixty per cent of the men with a positive reaction to the vaccine were improved, as against 70 per cent with a negative result. It is probable that the degree of natural immunity governed the extent of the reaction, and that the individuals with a negative reaction had a higher degree of immunity than those with a positive reaction. Cases showing pathological conditions of the nose and throat were 69 per cent improved, as against 68 per cent in the negative cases. The only significant variation was in 55 cases with tonsillar disease which showed an improved rate of 62 per cent. The duration of the immunity produced by an attack of respiratory disease apparently varies over a wide range. A repetition of the maximum dose of vaccine at intervals of 30 to 60 days throughout the season of the prevalence of colds would probably increase the percentage of favorable results.—James M. Adams. *South. M. J.*, 22: 354–356 (Apr.), 1929.

Gall Bladder Operative Mortality—The medical report of 1927 for Garfield Memorial Hospital, Washington, D. C., shows that 169 operations by 23 operators were performed on the biliary tract. Of these operations, 8.8 per cent were fatal. Two of the operators performed 77 of the total operations, with a mortality of 5.1 per cent, as compared with 15 occasional operators whose death rate was 11.5 per cent. For the years 1926 and 1927 the total was 302 operations with a mortality of 6.9 per cent. The mortality rate for the individual operators varied from 1.6 to 28 per cent for the 2 years, giving evidence of some difference in methods used. A study of the charts of the fatal cases suggests that but 3 of the 21 could be classed as plainly unavoidable. In 3 others death may have been due to errors in technic. In 6 cases, death could be attributed definitely to poor judgment, and in 7 there was unquestionably an error in technic. In the last 2 there was error either of judgment, technic, or both.—J. Russell Verbrycke. *South. M. J.*, 22: 452–455 (May), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

CHLORO–PHENOL TASTES AND ODORS IN WATER SUPPLIES OF OHIO RIVER CITIES*

H. W. STREETER

Sanitary Engineer, U. S. Public Health Service, Cincinnati, O.

FOR several years past, and particularly since the war, tastes and odors of such a nature as to identify them with the presence of phenols and allied substances, have been experienced with varying frequencies in water supplies of cities located on the inland waterway systems of the middle-western and eastern portions of the United States. Tastes of a similar nature have appeared in water supplies located in other areas, both of this country and Europe. In no instance, however, has this difficulty been more serious or affected larger groups of population than in the area adjoining and tributary to the upper portion of the Ohio River, which drains a highly industrialized region serving as a center of the coal, steel and allied industries.

A search for the specific causes of the tastes and odors above described revealed the fact that during and since the war period the coke producing industry has been abandoning the use of the older "bee-hive" ovens for burning coke and has been substituting for them modern by-product plants, from which valuable substances are recovered from the gases which formerly went to waste in the atmosphere. The residues from some of these recovery processes, notably those concerned with the manufacture of benzol and ammonia, have been found to contain very considerable amounts of tar, phenols, cresols, creosotes, and similar substances, which, when discharged into sources of water supplies, produce characteristic "medicinal" tastes and odors in them which will be designated hereafter by the single term, "phenols." Although other classes of wastes, notably those derived from producer-gas plants, have been found to contain phenols and like taste producing substances, the relative total amounts of phenols resulting from the operation of coke by-product plants are so much greater than those produced by any other single industry, and their production takes place in such highly concentrated areas, that a large share of the responsibility for the difficulties caused by wastes of this class logically has been attributed to them.

In the upper portion of the Ohio River basin and especially along the Ohio River proper, the situation has been aggravated by the fact that in order to produce bacterially safe effluents for drinking purposes, municipal water purification plants are forced to resort to continuous chlorination of the water in addition to its coagulation, sedimentation and filtration. This condition is

* Discussion of Disposal of Phenol Wastes, by F. Holman Waring, presented before the Public Health Engineering Section of the American Public Health Association at the Fifty-seventh Annual Meeting at Chicago, Ill., October 18, 1928. *A. J. P. H.*, 19, 7: 758 (July), 1929; Discussions, 19, 7: 817 (July) and 19, 8: 901 (Aug.), 1929.

due primarily to the large volumes of untreated sewage being discharged into this river system. The addition of chlorine to water containing small amounts of taste producing phenols has been found to intensify the tastes caused by these substances, probably owing to the formation of chloro-phenol and allied compounds which are known to have exceptional taste producing properties.

In March, 1924, a report was prepared by Sanitary Engineer H. R. Crohurst of the U. S. Public Health Service, giving the results of a survey which he made of the water supplies affected by tastes of phenol origin and of the industrial plants producing phenol bearing wastes within the Ohio River basin. In his report, 17 coke by-product plants were listed at that time as discharging wastes of this character into the Ohio and its tributaries. Later reports submitted by the Departments of Health of Pennsylvania, Ohio, West Virginia and Kentucky, at a joint conference held in February, 1926, indicated that about the same number of plants were actively discharging phenol wastes at that time in this river basin.

Systematic records of the appearance of phenol tastes in Ohio River water supplies have been maintained since late in the year 1921 by operators of municipal water purification plants located along the river. These records have been collected by the U. S. Public Health Service from time to time and brought together for comparison. A summary of these records, showing the periods and roughly the relative intensities of phenol tastes observed in Ohio River water supplies, is shown graphically in Figure I, which has been plotted from these records. In this diagram are shown also the approximate locations, with respect to the various water intakes, of coke by-product plants discharging phenol wastes into the Ohio River and its tributaries at intervals during the period 1924 to 1927, inclusive. It will be noted in this connection that of the 17 plants indicated as discharging phenol wastes in 1924, only 4 were given as remaining actual contributors in 1927.* The reduction was brought about as the result of joint efforts by the Ohio River states and manufacturers, following conferences held in 1924, 1925 and 1926. The work thus accomplished has been described so fully † that it is unnecessary here to discuss that phase of the subject.

On referring to Figure I, it will be noted that up to the end of the year 1925, tastes of phenolic origin were present at frequent intervals and, during some periods, almost continuously, in the water supplies of East Liverpool and Steubenville, located, respectively, 43 and 65 miles downstream from Pittsburgh, and in those of Ironton and Portsmouth, located 326 and 355 miles downstream from the same point. At Ashland and Huntington, located short distances upstream from the Ironton-Portsmouth zone of the river but about 240 miles downstream from Steubenville, the recorded tastes were considerably less both in frequency and intensity; likewise at Cincinnati, located about 106 miles downstream from Portsmouth. At Louisville, 130 miles downstream from Cincinnati, no tastes of phenolic origin were recorded until December, 1925, and January, 1926, when a wave of these tastes, of unusual intensity, penetrated throughout the entire river down to this point.

Following the December–January phenol wave of the winter of 1925–1926, a renewed coöperative effort was made by the states of Pennsylvania, Ohio,

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* In a recent paper, Waring indicates that in the autumn of 1928, this number had been further reduced to 2 plants, located, respectively, at Wierton and Follansbee, W. Va.

† Waring, F. Holman. Results Obtained in Phenolic Wastes Disposal under the Ohio River Basin Interstate Stream Conservation Agreement, *A. J. P. H.*, 19, 7: 758 (July), 1929.

West Virginia and Kentucky to bring about the elimination of phenol bearing wastes from the Ohio River system. The results of this effort, which left only 4 recognized sources of phenol pollution in the Ohio River at the end of the year 1927, were evidenced, as shown in Figure I, by a well marked diminution in the frequency and intensity of phenol tastes in Ohio River water supplies, the only outbreak of serious proportions during this period occurring in December–January of the winter of 1927–1928. The change in the status of such tastes occurring after the winter of 1925–1926 is further indicated by Table I, showing the months of the years 1924 and 1925, as compared with those of 1926 and 1927, in which tastes of phenolic origin were recorded in the water supplies of various Ohio River cities:

TABLE I

	Total Months in Which Tastes Occurred	
City	*1924–25*	*1926–27*
E. Liverpool	11	4
Steubenville	24	3
Huntington	5	2
Ashland	3	3
Ironton	7	3
Portsmouth	13	8
Cincinnati	2	4
Total	65	27

These figures fail to show the true contrast existing in the prevalence of tastes during the two periods indicated, because they do not take account of the greater intermittency and less intensity of such tastes during the later period. If these factors could be weighed properly they probably would show that a reduction amounting to fully 90 or 95 per cent has taken place since the end of 1925.

Aside from the foregoing indications, the conditions illustrated in Figure I are of considerable scientific interest in that they afford fairly definite evidence that the concentration of taste producing phenols in the river has had a marked tendency to become progressively reduced in passing downstream, to a greater extent than can be accounted for by increased dilution or by any other wholly physical influence. The evidence at hand sugggests very strongly, in fact, that a large part of the reduction observed is due to some natural process of purification, similar in its general mode of action to other phenomena commonly associated with the self purification of streams.

The tendency above noted is indicated, broadly: (a) by the sharp reduction in the prevalence of phenol tastes observed in water supplies located at considerable distances downstream from sources of phenol pollution, as compared with their prevalence in supplies located in the more immediate vicinity of such sources of pollution, and (b) by the marked seasonal variations in the relative frequency and intensity of phenol tastes occurring in all of the Ohio River water supplies and especially in those further removed from sources of phenol pollution.

On referring to Figure I, it will be noted that during concurrent periods phenol tastes occurred less frequently at Huntington, Ashland, Cincinnati and Louisville, all of which were located at distances of more than 100 miles downstream from recognized sources of phenol pollution, than at East Liverpool, Steubenville, Ironton and Portsmouth, which were located within short distances of such sources of pollution. The reduction observed has been particularly striking between Steubenville and Huntington, a distance of 242 miles, and between Portsmouth and Cincinnati, a distance of 106 miles. In the latter instance the reduction in the frequency of phenol taste prevalence, amounting to over 80 per cent, occurred in a river stretch in which the total amount of dilution water added to the Ohio, mainly through the Scioto River at Portsmouth,

ordinarily is less than 10 per cent. In the former case, it likewise could be shown that the reduction experienced in the prevalence of phenol tastes was far greater than would be accounted for in terms of added dilution water.

It will be noted in Figure I that although phenol taste producing substances penetrated throughout the Ohio River as far as Cincinnati on several occasions during the winter and early spring, they did not appear during the summer or early autumn at any of the cities removed by any considerable river distance from points at which phenol wastes were discharged into the river. If dilution were a material factor in these variations, their trend would be expected to be exactly the opposite of that actually observed, as the maximum

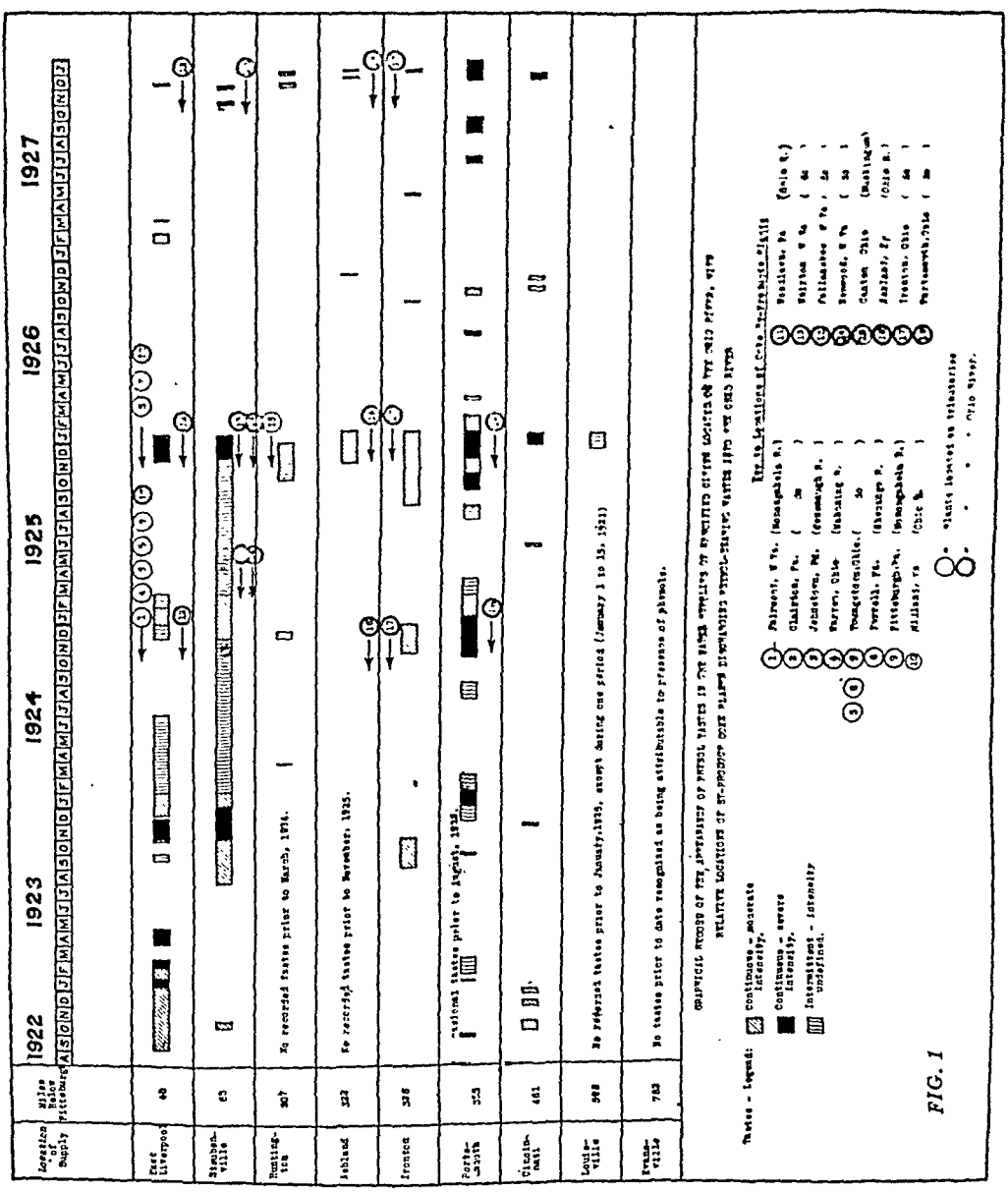


FIG. 1

dilution provided by the Ohio River occurs in the winter and early spring, when the river usually reaches its highest discharge.

Although no data are at hand concerning the seasonal trend of production of phenolic wastes by coke by-product plants, it hardly would appear, from the nature of the industry, that such wastes could be produced in sufficiently greater volumes during the winter-spring season, as compared with the summer-autumn period, to account for the wide seasonal variations above noted.

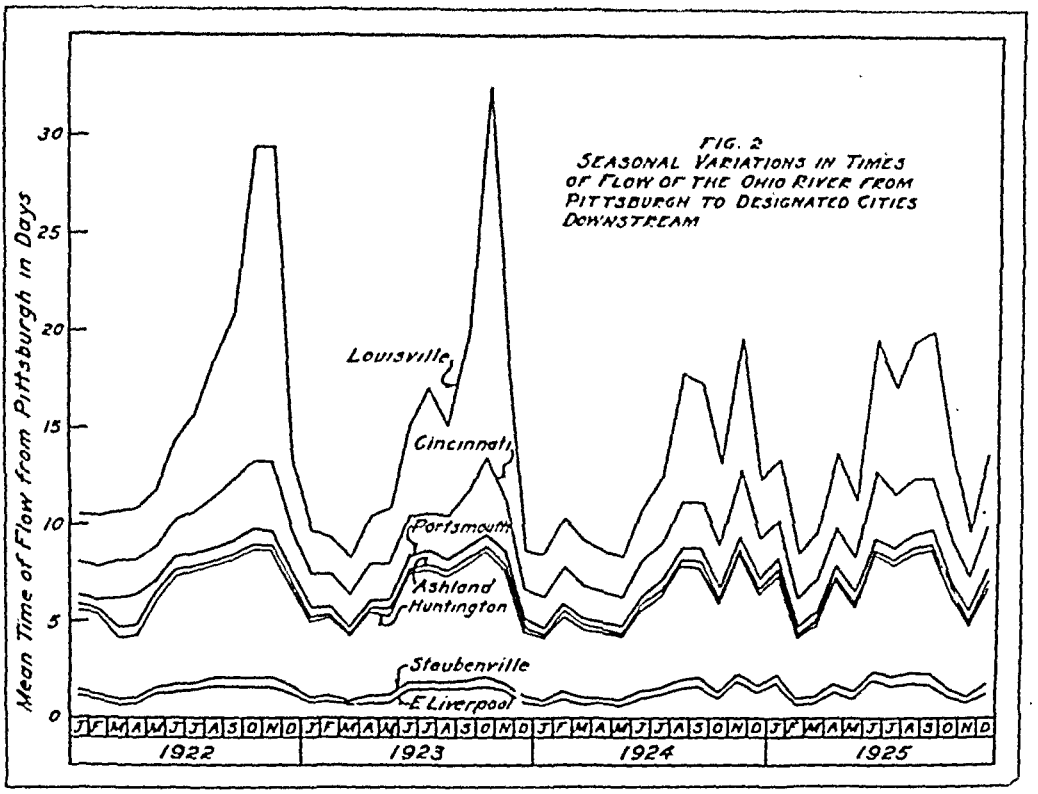
The condition shown in Figure I is entirely consistent, on the other hand, with the view that the changes in phenol tastes prevalence observed in the various Ohio River water supplies, both seasonally and geographically, have resulted largely from some natural process of purification which, though limited in its degree of action, like all other processes of stream self purification, is sufficiently powerful to bring about a marked progressive reduction in the concentration of phenols in stretches of the river relatively undisturbed by pollution of this character. Thus it is noted that the maximum reduction has occurred during the summer and early autumn seasons when the Ohio River usually reaches its lower stages and the effect of longer times of flow, as illustrated in Figure II, is accentuated by that of higher stream temperatures. In general, the periods in which evidences of phenol pollution, as gauged by the appearance of tastes in water supplies, have penetrated to the downstream points far removed from the sources of such pollution, have occurred coincidently with shortened times of flow, as indicated in Figure II, and with relatively low stream temperatures, both of which conditions tend in general to bring about reduced natural purification effects in streams.[1]

In the foregoing connection, reference may be made to recent studies by Mohlman[2] and his associates, which have shown that the oxidation of phenols, which can be accomplished by ordinary biological processes of sewage treatment when phenolic wastes are mixed in proper proportions with sewage, is essentially a biochemical phenomenon, proceeding along definite time-function curves at rates varying closely with the temperature, being greater at higher temperatures, and *vice versa*. As the behavior of phenols in the Ohio River has been consistent, except in degree, with their reactions to artificial processes of oxidation, it would seem quite logical to infer that the progressive reductions thus observed under natural conditions may be due to a process of natural biochemical oxidation similar in its general characteristics to that which proceeds more intensively under artificial conditions.

If the foregoing theory is correct, its lesson is fairly obvious, in so far as its application to problems involving the elimination of sources of phenol pollution of water supplies is concerned. In cases in which water supplies are subject to continuous or frequent pollution by phenols, the important sources of such pollution are more likely to be found in the vicinity of the supply than at any considerable distance.

If, however, they are subject only to occasional pollution, occurring more especially during the colder season or, in streams, coincidently with high river stages, the source of the trouble probably is located at a more distant point.

In undertaking any general program of remedial measures, looking to the relief of phenol pollution of water supplies located along an entire stream, the maximum immediate benefit of such measures probably will be attained by eliminating, first, all sources of phenol pollution located directly on the stream in question or in the lower reaches of tributaries discharging into the main stream above the points at which the



water supplies affected are located. The history of phenol tastes in Ohio River water supplies, both during and following the institution of progressive remedial measures by the bordering states, has afforded an interesting confirmation of the principle stated, as is indicated in Figure I.

The effectiveness with which the pollution of Ohio River water supplies by phenol wastes has been brought under a large measure of control within the comparatively short period of time intervening since the year 1925 constitutes one of the brightest pages in recent sanitary history. Accomplished, as it has been, without any coercive legislation, but through the medium of coöperative effort by the federal and state governments and the industries concerned, it augurs well for the future solution of some of the larger problems of stream pollution now confronting the nation.

Although pollution of the Ohio River system by phenol wastes has not been completely eliminated, as evidenced by occasional "spills" which have occurred during the past year or two, it has been curbed to such an extent as to justify the expectation that in the near future it will cease to be a major problem along this important waterway. A generous measure of credit is due to those whose joint efforts have brought about this fortunate result.

REFERENCES

1. See *Pub. Health Bull. No. 143*, pp. 298–335; *Pub. Health Bull. No. 171*, pp. 179–199; *Pub. Health Rep., Reprint No. 1063*, pp. 31 and 45; also *Reprint No. 1232*, pp. 9–13.

2. Mohlman, F. W., The Biochemical Oxidation of Phenolic Wastes. *A. J. P. H.*, 19, 2: 145 (Feb.), 1929.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Heating and Ventilation of Liverpool Cathedral—While the first structures including the Lady Chapel, Vestries, etc., of the new Cathedral, begun about 20 years ago, were arranged to be heated by a system of warm air and hot water, the plan for the rest of the immense structure, which, when finished, will be the largest in England and the next in size to St. Peter's at Rome, is to be heated by a new system known as a "warm floor." The system however was used by the Romans as may be seen in the baths at Bath, and the baths at Caracalla at Rome.

Almost the entire floor space consists of a double floor, enclosing a system of shallow ducts. The same air is circulated continually by means of a ventilating fan located in the basement and a hot water coil to raise the temperature to about 80°. Thus the floor becomes an immense radiator, although its temperature is considerably below blood temperature, and for this reason does not feel warm to the feet.

There will be no drying of the air of the Cathedral; heat will be evenly distributed and down draughts prevented; there will be no admixture of the heated air with that of the room space; fresh air for ventilation will be provided otherwise; neither the floors nor the walls will be obstructed by heating devices with their consequent staining effects; and heat will be uniformly distributed also at various levels above the floor, thus providing for "cool heads and warm feet."

The heating system will be put into operation as soon as the basement is finished, so that construction of the building may proceed to completion avoiding the damage which often occurs to joinery and fittings due to weather conditions. While the initial cost is a little greater, the low temperature maintained provides for an unusually economical working. The system is adaptable to houses, churches and halls. —Sir Giles Gilbert Scott, R.A., Architect, G. N. Haden and Sons, Ltd., engineers, Trowbridge, England, 27 pp., ill. (See also *Liverpool Cathedral, Official Handbook* (3d ed.), July, 1924, pp. 85–87.)

Atmospheric Pollution—The annual report for Rochdale (England) for 1927–1928 continues to emphasize the nature of atmospheric pollution, the chief ingredients being tarry matters soluble in carbon bisulphide, the sulphates, chlorine and ammonia. The main source of these tarry matters is the smoke from domestic fires, where the combustion of coal is less complete than in the furnaces of factories. It is a striking fact that rain brings down the soluble impurities of the atmosphere, but has little effect in bringing down the insoluble matter or soot. The explanation of this selective action of the rain probably lies in the fact that the particles of soluble matter containing hygroscopic salts form a nucleus for the rain drops, while the insoluble matter represented by sooty particles of a tarry nature tends to repel water.

While 4 years previously the average monthly deposit was about 63.5 tons per square mile, the deposit for the current year is but 33.24 tons. This decrease is undoubtedly related to the increase in the use of gas and electricity, as a substitute for coal, as a source of

heat and power. In fact, it is calculated that electric power units now used in Rochdale avoid the consumption of roughly 100,000 tons of raw coal per annum by private plants. Further decrease is to be expected from scientific treatment of raw coal to produce a smokeless fuel.—*Med. Off.*, 1089: 248–9 (June 8), 1929.

Health Leaflets for the Printing Trades—Twelve leaflets are enclosed in a folder bearing the above title. One makes an especial appeal to the employer to provide adequate ventilation, sanitary conveniences, seats and vacuum methods of cleaning; another appeals to the employed to coöperate in maintaining proper ventilation, the use of sanitary arrangements, lockers, canteens, the avoidance of the common drinking utensil, and of spitting; another discusses briefly healthy habits but has the rather surprising statements for the prevention of influenza and common colds—"a simple and yet effective preventive is to draw warm water through the nose, morning and evening," and "all cuts and scratches should be kept scrupulously clean and covered with plaster or other dressing."

The leaflet on the prevention of lead poisoning states that within the last 12 years there have occurred 230 cases (presumably in the Printing and Allied Trades of the United Kingdom) of which number 98 were compositors, 55 stereotypers, 20 linotypers, 14 monotypers, 2 electrotypers and 41 otherwise employed. Of this total, 160 cases occurred in ordinary letterpress printing, and 70 in newspaper works. The cases occurred in 185 plants.

The leaflet entitled "Precautions against Consumption" advises that in sedentary occupations the most suitable temperature for a workshop is from 60° to 65° F. One leaflet is devoted to ventilation and health; another to the dangers of bronzing with the claim that bronze dust appears to render workers very susceptible to diseases of the respiratory organs, such as pneumonia and pleurisy. A 4-page leaflet is devoted to good lighting of printing offices; a similar one to the dangers of defective eyesight, this prepared by W. B. Barker, past President of the British Optical Association; and a pamphlet devoted to convalescent homes. In connection with defective eyesight, of 139 employees who were examined by a specialist, 61 were found to require glasses. In another instance, of 134 employees, 86, or 64 per cent, needed glasses or revised prescriptions.—Joint Industrial Council, Printing and Allied Trades of the United Kingdom, 7–10, Old Bailey, London, E.C.4.

Industrial Clinic at McGill University—Dr. Frank G. Pedley, Director, announces that the industrial clinic operated by McGill University in the Montreal General Hospital celebrated its first anniversary in October, 1928. It had a most satisfactory year, having had more than 1,600 people in attendance for examination or treatment. Likewise it stimulated the installation of health service in many industrial plants. It will shortly inaugurate a dental clinic.—*Canad. Pub. Health J.*, XX, 2: 108 (Feb.), 1929.

Tuberculosis in Industry—The Philadelphia Health Council showed that approximately 1.8 per cent of cases of active or suspicious tuberculosis were to be found in small plants, while concerns having well organized medical departments have but 2 to 5 new cases appear per 1,000 employees each year. A definite chest clinic in connection with the medical department is of great value. Arrangements should likewise be made for sanatorium treatment, and fellow workers permitted to visit the sanatorium and, in fact, it is worth while to have one or two employees ac-

company the patient to the sanatorium in order to permit them to spread their impressions when they return.

Unquestionably, arrested cases of tuberculosis should not be put back into strenuous labor nor into any positions where health hazards exist. They should not be permitted to do piecework or any work in which there is an incentive or bonus. With wages and living conditions as they are in the United States at present, the economic status as a cause of tuberculosis has been largely overcome.

In the discussion which followed the above paper, Dr. Sawyer emphasized the necessity of getting all contacts under supervision, especially those in the family. Dr. Garner mentioned a philanthropic industrial plant near New York City manufacturing uniforms and washable goods which employs only recuperatives from tuberculosis.

Dr. L. R. Thompson of the U. S. Public Health Service emphasized that the latest British mortality data point out the unusual importance of tuberculosis as an industrial health problem, the disease being still the greatest cause of death in British industries. Likewise every industry having a high tuberculosis rate has a high death rate from other causes. It is striking to note that those industries which need healthy, strong individuals, such as the steel industry, as a rule, have a low sickness rate and a very low death rate, while less strenuous industries, such as clothing manufacture, have the higher disease rates and death rates.

Dr. Guy L. Kiefer, State Commissioner of Health of Michigan, and a consultant for the telephone company, emphasized that more or less delicate girls appeal to them for employment among whom many are found with a slight rise of temperature and a fast pulse when they apply for work. These are requested to return as often as three subsequent afternoons when, if temperature and pulse readings are not satisfactory, they are refused employment and given advice to consult their physicians or, where they say they have none, they are reported to the Board of Health.—T. Lyle Hazlett, Westinghouse Electric and Manufacturing Co. *Bull. Am. Assoc. Indust. Phys. & Surg.*, III, 1: 2–4 (Mar.), 1929.

Lead—This is Health Practices Pamphlet No. 3 of the new Division of Industrial Health, National Safety Council, 108 East Ohio Street, Chicago, Ill. The pamphlet is a compilation of experience, and should not be confused with official or insurance requirements. The more dangerous lead trades are specified as well as the commoner lead compounds. The toxicity of lead compounds is briefly discussed with a paragraph upon the portals of entry into the body and several upon the fate of lead compounds in the body. A synopsis is given of the diagnosis of lead poisoning, the chief clinical manifestations, the distinction between lead absorption and lead poisoning, and particular attention to the prevention of lead poisoning, both as regards the individual employee and his place of employment. A short bibliography follows. Illustrations show the lead line in the gums, wrist drop, stippled red cells and a proper exhaust system for the protection of workers. There is also a special form for employment and periodic examination of lead workers.

The Prevention of Lead Poisoning—The article discusses proper housing and working conditions in the lead industries, and should be consulted by those interested in the subject.—May R. Mayers, *Indust. Hyg. Bull.*, New York State Dept. of Labor, 124 East 28th Street, New York, N. Y., V, 9: 33–34 (Mar.), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Vitamin A in Avocados—A study of the vitamin A content of avocados was undertaken in view of the probability that their method of growth was favorable to the synthesis of this vitamin. The type used was the Calavo, the highest grade of the fruit, and all determinations were made on the fresh fruit. In the preliminary experiment albino rats in cages with raised screen bottoms were fed 3 different diets, normal diet, vitamin-A-free diet, and avocado diet using 5 gm. of avocado daily. The butter in the normal diet was replaced by lard in the vitamin-A-free diet, and was substituted by 5 gm. of avocado pulp in the avocado diet. Growth curves in this experiment showed the presence of vitamin A. Negative controls developed severe ophthalmia which did not appear in animals on either the normal or avocado ration. In the same experiment on younger rats, 30 days old, weighing about 50 gm., the animals were placed on the Osborne and Mendel control diet. All animals were exposed to the direct rays of the sun 2 days a week. Rats were divided into 4 groups: negative control with no avocado and 3 groups respectively 2.5, 5.0, and 7.5 gm. avocado daily. Ophthalmia appeared in about 5 weeks on the vitamin-A-deficient diet, the test diet starting after the development of ophthalmia. All of the controls were dead at the end of the 3d week, but on the avocado diet maintained good growth for 8 weeks. The growth curves would indicate that the quantity of avocado necessary to maintain good growth for the 8th-week period would be less than the 2.5 daily dose. It is pointed out that the high oil content of this grade of avocado was a significant factor.—Leroy S. Weatherby, J. Ellsworth Youtz, and Ruth V. Watson, *J. Home Econ.*, 21: 360 (May), 1929.

The Action of Irradiated Ergosterol in the Rabbit—Previous investigations chiefly on rats as experimental animals have indicated the toxic effect of excessive doses of irradiated ergosterol. This work was undertaken on rabbits weighing 2.2 to 2.6 kg. and the ergosterol administered orally or intramuscularly, in doses from 0.5 to 10 mg. The ergosterol was dissolved in almond oil, and preliminary tests indicated that the minimal curative dose was 1/20,000 mg. compared to the minimal dose of 8 mg. for cod liver oil.

Autopsies were performed on all animals and chemical determinations were made of calcium in the various tissues. The experiment indicated that doses of irradiated ergosterol greater than 1.0 mg. are decidedly toxic to the rabbit whether the drug is given orally or intramuscularly. Autopsies showed considerable calcium deposits in animals receiving more than 2.0 mg. of ergosterol and none in those receiving 1.0 mg. or less. The deposit was centered in the thoracic aorta, the kidneys and the lungs.

Experiments were undertaken to show the effect of the ergosterol on serum calcium and inorganic phosphate. An increase of serum calcium of from 38 to 49 per cent above normal was produced by doses of 2 to 10 mg. of ergosterol. The smaller doses were less pronounced although the tendency was to some increase. Experiments on some of the

animals with hypercalcemia showed that 10 days after the treatment was discontinued the serum calcium returned to the normal level. The effect on the inorganic phosphorus of the serum was not so definite because of the greater normal variations, but it appears that the administration of sufficiently large doses tends to develop the high inorganic phosphorus level.

An experiment was made to determine the effect of irradiated ergosterol on the tissues. Calcium was estimated in the lungs, kidney, liver, gluteal muscle, and spleen. In the latter organ determinations were averaged for the group. This experiment showed an enormous increase of calcium in the kidneys and lungs, but not in the gluteal muscle and liver, indicating a selective action for the irradiated ergosterol. Doses of 1.0 mg. or less apparently effected no increase of tissue calcium.

A discussion follows as to the relation of hypercalcemia produced by the irradiated ergosterol to the tissue calcium.—Maurice I. Smith and E. Elvove, *Pub. Health Rep.*, 44: 1245 (May 24), 1929.

The Vitamin Content of Honey—The literature from 1918 to 1923 reports investigations of honey to determine vitamin efficacy, all of which showed negative results. In view of the progress in vitamin research, the present experiment was undertaken on honey, testing for vitamins A, B, C and D. Two samples of honey were tested, one an English honey and the other of West Indian origin. There is given a description of the English sample of honey, which when extracted contained 84.95 per cent of dry matter and 0.10 per cent of ash.

Vitamin A was determined in young rats 35–40 gm., in separate cases, on a fat-soluble vitamin-free diet. After vitamin A deficiency was apparent 2 gm. daily dose was administered with a series of negative and positive controls, the latter with 3 drops of cod liver oil. Results showed that 2 gm. of honey contained no appreciable quantity of vitamin A. Vitamins B_1 and B_2 wese estimated on 6 groups of rats with various modifications in the basal diet with the 2 kinds of honey supplemented by autoclaved or dried yeast. All animals received 3 to 5 drops daily of cod liver oil. All the animals except those receiving the dried yeast showed little growth and this was true even when an antineuritic supplement was added. It was concluded, therefore, that both samples of honey were deficient in vitamins B_1 and B_2.

Vitamin C was tested on guinea pigs rendered scorbutic on an appropriate diet. The honey administered was diluted with one-third water, with the initial dose of 3 gm. being gradually increased. Results indicate insufficient antiscorbutic potency in the dose given, averaging around 5 gm. Vitamin D was tested on young rats on a rickets-producing diet low in phosphorus, the animals receiving a daily dose of 2 gm. of each of the different honeys. Negative controls and positive controls with 3 drops of cod liver oil were employed for each honey. Both honeys indicated no appreciable amount of vitamin D.—Edward Hoyle, *J. Biochem.*, 23: 54, 1929.

Effects of High Cereal Diets on the Growth of Infants—Growth and development of 1,200 Japanese and 869 Filipino infants in Hawaii were observed during the first 2 years of life. Diet of both races is high in rice and lacks milk, and infants are breast fed. Three hundred and seventy-nine Hawaiian infants were also examined for skeletal development.

A diet abundant in cereal without milk is compatible with a high birth rate, moderate infant mortality and good growth of the offspring during lactation

for the first 5 months of life, when infants are dependent on breast milk alone, if the mother's diet includes suitable, adequate, supplementary food other than milk.

After 6 months, when the infants have reached the age when additional food is needed, the gain in weight is not so rapid as when cow's milk is used as a supplementary food in the diets of infants. The subtropical location provides sufficient ultra-violet rays in the sunlight to give almost complete protection against rickets, which disease is extremely rare and is mild when it occurs.

Carpal centers develop early in infants in Hawaii. The eruption of deciduous teeth occurs early; earlier for the Japanese than for the Filipino infants. Dental caries was rare during this period of dentition. Disturbances of calcification appear to cause delayed dentition during the second year of life, rather than dental caries.—V. B. Appleton. *Am. J. Dis. Child.*, 37: 284 (Feb.), 1929.

Fatal Septicemia in Man Due to Bacillus (Salmonella) Suipestifer—*B. suipestifer* infections in man are not numerous, but it is not unlikely that they occur frequently unrecognized. Confusion as to the identity of the organism is responsible for a lack of accurate knowledge as to the incidence of infections in the past, and this may account for the failure to find more instances of this infection in man.

Jordan separates the organisms of porcine origin into at least three groups, (1) *B. suipestifer,* (2) *B. Paratyphosus B* (porcine), and (3) *B. typhi suis* or *B. suipestifer voldagsen* or *glasser.* The authors believe that the organism here discussed belongs to the first group of Jordan's classification, namely *B suipestifer.*

The authors indicate that this report shows the necessity of considering *B. suipestifer* as an agent in the production of febrile conditions simulating typhoid fever, especially when organisms of the paratyphoid group are isolated from the blood and all agglutinations with stock strains of *B. typhosus* and *B. Paratyphosus A* and *B* fail.

This article reports a fatal human infection suggesting typhoid fever and due to an organism with the cultural and serological characteristics of *B. suipestifer.* No necropsy of the body was permitted. The patient, an Italian stone mason of 46 years, was admitted to the hospital one week after he showed symptoms. During the course of the disease 3 blood cultures were taken; the first on the 10th day of the disease yielded approximately 8 colonies per c.c., the second on the 16th day of the disease about 75 colonies per c.c. and the third, at death, 225 colonies per c.c. The blood of the patient gave a negative Widal reaction with stock strains of *B. typhosus* and *B. paratyphosus A* and *B.* With the organism isolated from the blood, good agglutination occurred to a titer of 10,000. Later, the patient's serum was found to agglutinate *B. suipestifer* in a dilution of 1:5,000. One c.c. of a 24-hour broth culture of the isolated organism was injected subcutaneously in a rabbit and death resulted in 84 hours. Organisms with cultural reactions similar to that of the patient and which were agglutinated by the patient's serum in a dilution of 1:20,000 were obtained from the heart blood of the rabbit. In other rabbits inoculated with this same organism, death resulted from septicemia and the lesions were marked congestion of the lungs, spleen, liver, kidneys and intestines, with focal necrosis of the liver and kidneys.

The cultural reactions of the isolated organism showed them to be practically identical with those of *B. suipestifer.* They were different from *B. paratyphosus A* and *B,* and *B. aertrycke.* By means of reciprocal agglutinin absorp-

tion tests, in addition to the cultural characteristics of the organism and the serological action of the patient's blood with *B. suipestifer*, the relation of the isolated organism to *B. suipestifer* is close enough to establish species identity. Unfortunately, the source of the infection was not determined.—J. T. Bauer, Margaret McClintock, *J. Infect. Dis.*, 44: 292 (Apr.), 1929.

Intramuscular Infection of Guinea Pigs with Spores of Cl. Botulinum—Evidence is given that with formalin as a tissue debilitant, approximately 25 viable heated spores of *Cl. botulinum* inoculated into the muscles of guinea pigs may grow luxuriantly and produce a potent toxin, and that *Cl. botulinum* sporulates readily in the debilitated tissues. Six-tenths to 0.8 c.c. of 10 per cent formalin (40 per cent) was the debilitant used. Using the same procedure, attempts to infect a series of laboratory rats with spores of *Cl. botulinum* were unsuccessful. Additional attempts to infect rats using saponin as the tissue debilitant also were unsuccessful. These unsuccessful attempts indicate the presence of antispore substances in the rats or failure to produce sufficient tissue necrosis, the author favoring the latter explanation.

No data are given as to the conditions necessary for growth of *Cl. botulinum* spores in the body; however, the author suggests that from the work of Coleman and Meyer (closed vein and eye culture) a condition of stasis as regards fluids in an organ and also the presence of a medium of necrotic and coagulated tissue may be favorable to spores' development.

The author also discusses the practical significance of his findings in regard to human infection by *Cl. botulinum* spores. He gives suggestive data which may have a bearing upon the absence of reported botulism due to war wounds. He also points out that many housewives are in the habit of heating canned goods suspected of spoilage and then consuming them. As some of this food may be a veritable culture of *Cl. botulinum*, the spores of which may not be killed by such heating, its consumption by a person having ulcerations or other severe lesions of the digestive tract might not be without danger; and he cites a Montana botulism outbreak caused by the consumption of soup, presumably heated, which was made from contaminated corn.—George E. Coleman, *Am. J. Hyg.*, 9: 47 (Jan.), 1929.

Development of Vitamin A during Ripening of Tomatoes—California tomatoes plucked from the vines green but mature, were divided into 6 lots as follows: (1) prepared at once, (2) ripened in light, (3) ripened in the dark, (4) ripened in ethylene, 1:2,000 parts for 1 week, (5) ripened in the dark with 3 periods of ultra-violet irradiation, (6) later taken from the vines in ripened condition. All lots were stored in jars with a layer of carbon dioxide with a temperature below freezing to prevent oxidation. Rats 21 days old after development of vitamin A deficiency were fed weighed portions of the tomatoes in addition to 0.5 gm. yeast daily with the basal diet. The experimental period was 56 days. The result showed the development of vitamin A in the ripened fruit compared to the green. There was practically no difference exhibited between the tomatoes vine ripened and those artificially ripened. Further experiments are in progress to determine quantitative relations of the fat-soluble pigments, carotin and lycopin, with chlorophyll, and vitamin A in tomatoes and other plants. It is suggested that carotin and lycopin have a protecting effect in the development of vitamin A in plants when exposed to sunlight.—Agnes Fay Morgan and Laura Lee W. Smith, *Proc. Soc. Exper. Biol. & Med.*, 26: 44 (Oct.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

JUDGING THE SUCCESS OF A DENTAL PROGRAM

ELEANOR G. MCCARTHY, S. B., D. H.

Consultant in Dental Hygiene, Massachusetts Department of Public Health, Boston, Mass.

IT is more difficult to measure success when dealing in terms of healthy childhood than in shares of stock or dollars and cents—difficult, but possible. Child health work is not unlike other projects—it has very definite goals—and while progress cannot be measured quantitatively, certain definite tests can be made to determine its general direction. While measuring rods are being developed that will show the difference between certain types of programs and grade the success of each, is there not some way in which each individual community may judge the success of its efforts? Wherever there are definite objectives, there must be success or failure.

In one phase of the community health program, the dental program, how can a community tell if its attempts to improve the condition of the children's teeth are successful? As realization of the benefits of stock taking on the part of the director and the staff is the first requirement, they must realize that any growing program needs its height and weight measured at regular intervals. It goes back to the fundamental matter of attitudes. The health educator, planning a dental health education program for a group of children, includes the attitudes that they should take toward good mouth hygiene as well as what they should know about their teeth and what they should do in caring for their teeth. Many health workers have overstressed the knowledge and the habits and have not realized that attitudes, intangible though they may be, determine the doing as much if not more than the knowledge.

DEVELOPMENT OF ATTITUDES

National and state organizations, whose privilege it is to guide communities in health matters, should consider the development of good attitudes as a most important part of their programs. Such organizations should determine the desirable attitudes toward community dental programs, and give that information to as many of the health workers as possible.

School dentists, school dental hygienists, and all public health nurses should have a clear conception of what the goals of the dental program are, and the difference between relief work of a temporary nature and corrective work so mixed with education that its benefits are lasting. Communities expect their workers to guide them, as they have the knowledge and training that is fundamental in this work.

All kinds of organizations are asked to assist in the campaign for better teeth and healthier mouths, and it is absurd to expect the directors of lay organizations to have a public health viewpoint in the matter. It is perfectly natural for them, for instance, to consider the ways and means of starting a dental clinic if the school nurse has mentioned repeatedly in her report the number of defective teeth and asked for aid in correcting the situation.

Offering clinic service to worthy chil-

dren is a logical activity of the private organization in question; but should it not consider the whole question—the whole program and its objectives—before laying plans for part of it, with any hope of success?

On the other hand, if an organization has conducted a dental clinic for several years without this preliminary discussion of objectives, is it not perfectly natural for it to measure success in terms of "total number of operations, visits, fillings, extractions and cleanings"? Public health workers are all familiar with annual reports of this kind.

Who is to blame in a situation like this?—A small wealthy community decides to conduct a dental clinic for all its school children; a program is planned, guided by the dental clinician, that is unusually good from the point of view of preventive dentistry. This program is continued for a period of 10 years; the problem of dental caries is practically under control; and the people in that community feel that they have a perfect dental program. They admit in the same breath, however, that they are worried because so few of the high school students take good care of their teeth!

To have all the children with teeth in good condition, saved by the early filling of defective enamel, kept clean, and cared for regularly by the school dentist and hygienist, is indeed success as far as a clinic is concerned; but the tragic part of this program is that the community is so wealthy that there is no need for a clinic. Practically every family could afford to have this work done by a private dentist. It is easier to appoint a dentist, and pay him, out of tax money, a small fraction of what they would have paid him as private patients.

This type of clinic is merely a means of getting dental service at low rates for all parents; it is not a community program, nor is it a public health project.

This may be an unusual case as far as the financial status of the community is concerned, but it is a typical case of the wrong attitude toward a dental program. It is, of course, the product of the era of dental clinics when the objective in everyone's mind was to correct existing dental defects if they were found to be affecting the general health and scholarship of the school children. It is "a menace to the child and an expense to the community."

The dental clinic based on a policy of prevention rather than repair has a very real place in the community dental program of today because practically every community has a certain number of children worthy of clinic care. The dental clinic should no longer be the main objective of the whole program, nor the main consideration when evaluating the success of a program.

Many new attitudes and new objectives concerning dental health work have been developed in the last few years. The communities with programs ten or fifteen years old are slow in adopting the newer point of view, but those communities that are considering the problem for the first time and those that are ever anxious to improve their present programs must consider these new attitudes before further progress can take place. While very little formal work concerning attitudes and objectives for a community dental program has been done, some suggestions are enumerated in the hope of stimulating some thought and action on this subject.

Desirable Attitudes—that should be taken by the community or organization in charge:

1. An interest in determining the objectives of a well rounded community dental program before starting any particular part of it
2. A willingness to develop the most permanent features of the program first
3. An interest in determining the actual needs before starting a dental clinic project
4. A realization that they may need expert advice concerning certain phases of the program

5. A realization that dental care is a personal or a family responsibility

Desirable Objectives—for the program itself:

1. To make available to every mother and father the best known means for caring for the teeth and mouth and preventing dental diseases
2. To teach the school children the care and importance of the teeth; help them to establish habits of regular care; and develop such attitudes as may be necessary for the carrying out of these habits throughout life
3. To determine existing dental defects among school and preschool children each year and notify parents of these defects
4. To correct existing dental defects by
   a. *Offering clinic service for needy children*
   b. Launching a general campaign to interest parents, dentists and the children themselves in having this work done

Once a community is made to realize the foregoing attitudes and objectives it should be ready to judge the success of its present program. Instead of asking an outside organization to evaluate the work for it, the community should attempt to determine at least some of the facts for itself.

The following list may help to indicate the kind of questions a community could ask itself:

The General Educational Program:

1. Do the average mother and father know the simple facts about teeth—their development and care?
2. What printed material is distributed to the homes?
3. What demonstrations, meetings or lectures have been held to interest mothers in this problem?

The School Program:

1. How many children go to the dentist twice a year? How many children go to the dentist when new teeth erupt?
2. Has dental hygiene a definite part in the health education program in the school?
3. Are good nutrition and regular dental care stressed in the teaching outlines for this subject?
4. How many children have formed the habit of keeping their teeth clean?
5. Do the students in the high school assume the responsibility of caring for their own teeth although helped by a clinic when in the primary grades?

The Dental Clinic:

1. Does the dental clinic serve only the children needing help financially?
2. Does it have a definite preventive policy, caring for the younger children first?
3. Is the amount of service sufficient to care for the poor children in at least the lower grades?
4. Do the parents pay part of the cost of service whenever possible?

Attitudes:

1. Are the children and parents interested in good teeth?
2. Do the parents consider the care of the teeth their responsibility or do they rely on the city for help, whether needed or not?
3. Are the various organizations in the community willing to coöperate with each other in building a well rounded program?
4. Do these organizations ask advice as to the latest methods of conducting dental examinations, dental clinics and other phases of the program?
5. Are they anxious to determine the success of their program so that they may seek to improve it?

A little wholesome introspection of this sort will not hurt any wide-awake community.

The following question summarizes this type of program: Is it wise to teach a child why he should care for his own teeth and interest him in doing so regularly, or is it wiser to care for his teeth for him without even explaining what you are doing? Incredible as it may seem there are many communities today carrying on the latter type of plan, and it is often called "successful."

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Ten Duties for Board Members—The following excerpt was originally presented as part of an address on "Function of Boards of Trustees and Committees," American Nurses' Association Meeting and Institute for Board and Committee Members of Nursing Organizations, Detroit, Mich., April 12, 1929:

1. To know why the organization exists and annually to review why it should exist.
2. To govern a board or a committee through joint thinking, not by majority vote.
3. To give money, or help get it, or both.
4. To face budgets with courage, endowments with doubt, deficits without dismay, and to recover quickly from a surplus.
5. To deal with the professional staff as partners.
6. To keep far enough ahead of the community to be progressive and close enough to it to be practical.
7. To interpret health work to the public in words of two syllables.
8. To deal with physicians on the assumption that the highest ideals of the profession dominate its every member and to face difficulties with recognition that both doctors and board members are human.
9. To be proud of a tradition but eager to improve it.
10. Always to combine a New England sense of obligation with an Irish sense of humor.

—Michael M. Davis, *Am. J. Nurs.*, XXIX, 6: 644 (June), 1929.

Frontier Nursing Service to Extend Territory—Public health nurses who have been fortunate enough to enjoy the hospitality and bring away some of the enthusiasm which abounds in the Kentucky mountains will be particularly interested in the *Fourth Annual Report of the Frontier Nursing Service.* The statement of the present financial status, an appeal for continued support and two objectives for the future are embodied in the brief foreword. Mrs. Breckinridge writes:

> There are two objectives the Frontier Nursing Service asks its supporters to keep in mind—one an immediate objective. We aim to treble our present territory and cover 1,000 square miles within the next four years. This will give us the statistical data Dr. Louis I. Dublin of the Metropolitan Life Insurance Company, who will tabulate it for us, considers necessary in order to demonstrate adequately that the work of nurse-midwives in remotely rural areas does lower the death rate of women and young children, and raise the general level of health of the population.
>
> Our second objective, once we have proved our purpose on a large enough scale to be convincing, is to raise an endowment which will enable us to carry our work into the length and breadth, height and depth of our American mountain ranges.

Feeding Fifty Folks More or Less—The summer number of the *Dairy Counciler* announces the advent of a new cook book. Not just a commonplace cook book this, with its bright cover and alluring illustrations which fairly make your mouth water, but an extraordinary one, for it caters to the imagination as well as to the palate. It is a compilation of recipes gathered together by Vera Armstead Hamilton, home economics graduate from Kansas State Agricultural College. Miss Hamilton is an experienced cafeteria director and consultant for church dinners and parties.

Public health nurses will eagerly seize upon this recipe book, especially if they are called upon to give advice or plan menus in quantities for home bureaus, community clubs, school lunches, junior clubs or camps.

Copies may be had for distribution from the National Dairy Council, 307 North Michigan Avenue, Chicago, Ill.

Asphyxia in the New-Born—In the June 8 number of the *Journal of the American Medical Association*, there is an article by Dr. Albert Mathieu and Dr. Albert Holman, in condemnation of the harsh and unscientific methods now used to resuscitate the new-born infant with atelectasis. They affirm strongly that the frail little body of the new-born infant is hurt rather than helped by the shocks of rough handling and cold water plunges. The method which they have used successfully and which they describe in detail in this article is based upon the fact that breathing is an involuntary process regulated by the brain center, by which carbon dioxide is given off by the blood and oxygen taken in. Although oxygen is necessary in the tissues and blood to allow the production of carbon dioxide, it is the accumulation of carbon dioxide which acts as a stimulant to the brain center. Asphyxia usually involves both low oxygen and low carbon dioxide content in the blood and tissues.

On this basis, a practical device has been worked out by which carbon dioxide (in mixture with oxygen) may be introduced into the trachea of the infant. The expired breath of the operator produces a satisfactory and convenient supply of carbon dioxide in mixture with oxygen, and a special catheter * with a trap is used, by which obstructive material may be withdrawn from the trachea and the carbon dioxide and oxygen mixture may be introduced.

The method is as follows:

Immediately after birth, the mouth of the infant is cleared of mucus and other superfluous material in the usual way. The baby is then placed on its right side and the cord is cut. If normal breathing does not start up after a short time or if attempts at respiration are evidenced by marked retraction at the costal margins without lessening of the cyanosis, the tracheal catheter is then used to remove any remaining mucus and fluid from the throat. It is then introduced carefully into the trachea and further fluid is withdrawn gently by suction by the operator. The catheter is cleared by blowing through it after its removal from the trachea. It is then re-inserted. The process of introducing the catheter into the trachea is easily learned. The writers state that their method is to have the baby's head supported over the edge of a table. The opening into the trachea is located by the right forefinger and the end of the catheter is guided in carefully under it.

The rate and force with which the operator sends air into the lungs is the most delicate part of the process. The operator should puff very gently about 40 times a minute and this should be kept up as long as the heart beats, until respiration is established. It may be repeated later if respiration fails again. It is extremely important that the baby's body heat be maintained through the entire process.

This method has given excellent results but, of course, does not work in cases of brain injuries and congenital deformities.—Dr. Albert Mathieu and Dr. Albert Holman, Resuscitation of the Asphyxiated Newborn. *J. A. M. A.*, 92, 23: 1917 & 1918 (June 8), 1929.—K. E. P.

Dedicated to Higher Education among the Colored Race—Of noteworthy significance was the statement made on June 19, 1929, when the Lincoln School for Nurses in New York City dedicated the new building to "its high purpose for the advancement and progress of scientific medicine among the colored race."

NEW PROGRAM OF HIGHER EDUCATION

In considering the future of Lincoln School as a center of higher education, 2 factors are outstanding: 1. The growing demand for its graduates as the health problems of the negro population

* The catheter is made by V. Mueller & Company, Chicago, Ill.

become more complex and more urgent. 2. The need, on the part of the graduates themselves, for positions of more responsibility, that they may utilize their training to the utmost and also develop their own latent capacities for leadership among their people.

To meet this twofold problem—Lincoln School for Nurses has adopted the following program as a guide to its activities in the immediate future. Details of this program will be carried out as rapidly as facilities, including financial resources, are available.

1. *Lincoln will coöperate with other movements organized to study and meet the needs of the negro population, especially those related to health*—It will make an intensive study of negro communities in the north, with the purpose of determining their need for nursing service.

2. It will expand its training of negro women by

(a) *Adding public health training.* All students will have four months' training along this line to include special work in the dispensaries, bedside nursing in the homes of patients from the wards and dispensaries, work in a communicable disease hospital, and field work in the Social Service Department of Lincoln Hospital and Henry Street Settlement. This training will be supplemented by *a course in principles of public health at Teachers' College.* Every effort will be made to develop qualities of leadership through this training.

(b) *Graduate courses in public health,* surgical nursing, pediatrics, midwifery, contagious diseases, administration. Scholarships will be provided for a limited number.

(c) *Effort to raise the standards of nursing education* in general, in the Lincoln School and other negro schools.

3. *Lincoln also proposes to develop a national placement service* for negro nurses, beginning with its own graduates This will include the development of opportunities such as the temporary subsidizing of a nurse in a needy negro community.

4. *An advisory service for negro nurses will be established* to aid them in securing training, in improving living conditions in positions held after graduation, and in other problems incident to their profession.

5. *Lincoln will invite affiliation with schools where training and experience are limited,* so that their picked students may take the last six months of their course at Lincoln.

Lincoln School is in a strategic position to carry out this program in full, because of its advanced equipment, its prestige as an institution of higher education and the standing of its graduates. Its association with Lincoln Hospital will be of increasing value, as the facilities of the hospital are enlarged according to present plans.

ERROR IN PUBLIC HEALTH NURSING PROGRAM

Through an error, the Thursday luncheon and afternoon sessions of the Public Health Nursing Section were listed in the Preliminary Program in the July JOURNAL (page 804) as closed sessions. These sessions, as well as all other meetings of this Section, are open sessions.

BOOKS AND REPORTS

Medicine. *Its Contribution to Civilization—By Edward B. Vedder, M.D., F.A.C.S. Baltimore: Williams & Wilkins,* 1929. 398 pp. Price, $5.00.

In the downpour of books on medicine and hygiene intended for the general reader, this one is somewhat "different." Not only is it couched in good language, but it is readable, the author possessing a subtle humor which frequently crops out, adding spice to the knowledge which is being imparted. One finds in this volume an accurate survey of what medicine has contributed to the world without any of the whoop and hurrah which too often accompanies such information, and without any of the misleading slogans which some of our boards of health have adopted.

While well balanced, it strikes us that Chapters I and VIII are particularly valuable, the first on the Causes of Disease, Predisposition, etc., and the last on Modern Preventive Medicine, which gives the story of the U. S. Public Health Service, and tells us what is going on. Curiously enough the average person accepts what is being done without any interest in knowing where it comes from. The reviewer is fond of asking students to whom they should apply for information on health subjects, or help along certain lines. Many of them do not even know that there are state boards of health, and except for the volumes of overheated air which emanate from Washington, many of them would never have heard of our Capital. We can hardly blame the average citizen for not knowing that Washington can furnish some real information, and that in the matter of health, it is the headquarters of the largest and best trained body of sanitarians in the world.

The book is beautifully printed, and can be heartily commended. A book of this type makes a reviewer feel that life is not simply a dreary drag of one thing after another. M. P. RAVENEL

Report of Fourth International Congress of Military Medicine and Pharmacy—*By W. S. Bainbridge, Commander M. C. F., U. S. Naval Reserve. Menasha, Wis.: George Banta,* 1927. Cloth. 248 pp.

The International Congress of Military Medicine and Pharmacy is assembled biannually for the purpose of collecting and standardizing methods employed in the prevention and treatment of disease and in the care of the sick and wounded in war and peace. The Fourth Congress was convened in Warsaw, Poland, on May 30, 1927, under the Presidency of General Stanislaw Rouppert, Surgeon General of the Polish Army. About thirty nations were represented. The United States delegation consisted of 5 medical officers, all of whom were members of the Reserve Corps of the Army or of the Navy.

The report as prepared by Commander Bainbridge is principally a compilation of official documents and communications presented to the congress on the subjects of Evacuation in Moving Warfare, The Etiology and Prophylactic Treatment of Influenza, and The Arsenobenzol Chemical Methods of Analysis and Estimation. Naturally, these subjects are considered from the viewpoint of military medicine, but contain much data of interest to those not directly concerned with military affairs. The papers dealing with influenza are good and

have a distinct public health interest. The reports on Evacuation in Moving Warfare should prove of value to students of the military phases of military medicine. The report contains a number of illustrations showing groups of delegates and views, most of which have not even the vaguest connection with the subject matter of the report. It is perhaps unfortunate that illustrations pertaining to military medicine as practiced in countries other than the United States were not used in lieu of some of those given in this book.

G. C. DUNHAM

Your Eyes and Their Care—*By Edgar S. Thomson, M.D. New York: Appleton.* 175 pp. Price, $1.50.

This little book is written with the hope of removing the disadvantages due to lack of understanding on the part of the usual uninformed person suffering with eye trouble. The aim is to give sufficient information that such a person may best coöperate with the eye physician. Dr. Thomson has admirably covered the subjects of anatomy and physiology without using too many technical terms. He gives the lay reader clear knowledge of what part of the eye is at fault, when the individual is nearsighted, farsighted, or astigmatic.

More such volumes from the hands of competent ophthalmologists will tend to offset vicious teaching now so common, particularly those misleading statements of charlatans that eye exercises improve vision of the nearsighted eye. Dr. Thomson makes clear that there is no inherent power to cause shrinkage or shortening of the globe which has already grown too long.

The frank discussion of squint is refreshing to lay people and commends itself to public health workers who are continually obliged to upset the teaching of old-fashioned doctors and of old-fashioned grandmothers about outgrowing squint (cross-eyes). This book emphasizes the fact that squint must be treated in the developmental period, that is, long before school age is reached.

Finally, public health workers will be pleased with Dr. Thomson's fine presentation of the relationship between malnutrition and disease of the eyes. Public health teachers have only begun careful observations in this field and it is well that an able clinician should lead the way in setting us right in his field.

A good deal of comfort will be afforded the sufferer with glaucoma or cataract by reading the chapters on these two subjects.

B. FRANKLIN ROYER

Dunn's Food and Drug Laws. Supplement January 1, 1929—*By Charles Wesley Dunn. New York: United States Corporation Company,* 1929. 228 pp. Price, $2.00.

Two-thirds of this paper bound supplement to the 3 volumes of *Dunn's Food and Drug Laws* are devoted to federal laws and regulations pertaining to foods and drugs, which were adopted during 1928, while one-third contains the new state laws and amendments of Alabama, District of Columbia, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia.

The volumes to which this is a supplement were reviewed and highly recommended in these columns in June, 1928.

J. A. TOBEY

The Writing of Medical Papers—*By Maud H. Mellish-Wilson, Editor of The Mayo Clinic Publications. (3d ed. rev.) Philadelphia: Saunders,* 1929. 184 pp. Price, $1.50.

The third edition of this book, the first of which appeared in 1922, under the name of Maud H. Mellish, will be welcomed. It has won its place as a standard. This latest edition has been increased in size, chiefly through addi-

tions to the list of medical journals and the abbreviations which should be used for them in references.

There are some inconsistencies to which attention must be called. On page 13, we are advised to "Use only English words and phrases," yet on pages 18 and 19 some 130 words and phrases, chiefly Latin and French, are given to show which are generally italicized, and which are not.

There is little question that words and phrases from foreign languages are often used in an attempt to show learning which has little existence in fact, and the advice to avoid such terms in general is good. However, some of them have become incorporated into our language, largely for the reason that there is no exact translation for them.

The section devoted to Standard Abbreviations for Medical Journals shows a number of inconsistencies as well as omissions. For example, the *American Journal of Physiology,* the *American Journal of Psychiatry,* and the *American Journal of Psychology* are incorrectly arranged. The *Clinical Journal* is placed below *Clinical Medicine,* as well as several others which it should precede. There are certain inaccuracies in abbreviations, as "Mental Hygiene," and "Jour. Ment. Pathology." The giving of "Mental" in full is not uniform with the *Quarterly Cumulative Index Medicus,* in addition to being inconsistent with the author's plan. The *New England Journal of Medicine* is still given as the *Boston Medical and Surgical Journal,* while no mention is made of the fact that *The Nation's Health* has been combined with the *American Journal of Public Health.* Among the omissions noted are *Physiological Zoology, American Journal of Science,* and *Journal of Nutrition.*

The book is well printed, and will doubtless hold its well earned position.

M. P. RAVENEL

Four Centuries of Medical History in Canada—*By John J. Heagerty, M.D., D.P.H. Toronto: Macmillan,* 1928. (2 vols.) 395 and 374 pp. Price, $12.00.

The author has rendered a distinct service, not only to Canada but to the medical profession in general. However localized history may be, it must contain lessons for the world in general, and the present volumes are full of material of wide interest.

The medical history of Canada goes back to the days of Francis I. The narration is unusually exact and well documented, since the Jesuit missioners kept daily records with meticulous care, which were sent to headquarters in France. The author has given us a picture not only of the early struggles of the French colonies centered particularly around Quebec, but also the development of medicine, surgery and public health in the various provinces, including Newfoundland, and the cities of the Dominion of Canada.

The first volume gives an account of the epidemic diseases—many brought in by the immigrants in ships which were overloaded and inconceivably lacking in the ordinary conveniences and decencies of life. We have an illuminating discussion of these epidemics, to which various names were applied. It seems clear, however, that yellow fever was one of the common scourges which went under the name of "ship fever," though the term included typhus, typhoid, plague, leprosy. and smallpox, brought from Marseilles where disease was common and from which many of the ships set forth for the French settlement of Quebec.

Another chapter deals with what was known as the *mal de la Baie St.-Paul,* the exact nature of which remains unknown, though the evidence is strong that it was syphilis widely disseminated extra-congenitally and in a form not known today.

Particularly touching are the accounts of smallpox among the Indians, and the courage of the priests who ministered to them.

The development of medical journalism, beginning with the *Quebec Medical Journal* in 1826, holds especial interest; but less than the foundations of medical schools, the first of which had its origin at the Montreal General Hospital in 1822; or hospitals, the earliest of which was instituted at Quebec in 1639.

There are many points of interest which the reviewer would like to stress, and would like especially to honor by name the pioneers who founded medicine in the new dominion, and those others who through 400 years have not only sustained the fair reputation of the profession, but have greatly extended it.

However, such books do not lend themselves easily to review. We can only advise that they be read, with the assurance that they have been written not only conscientiously, but with literary skill.

The printing and make-up are good.

M. P. RAVENEL

BOOKS RECEIVED

THE WRITING OF MEDICAL PAPERS. (3d ed.) By Maud H. Mellish-Wilson. Philadelphia: Saunders, 1929. 184 pp. Price, $1.50.

HYGIENE OF THE MOUTH AND TEETH. By Thaddeus P. Hyatt. Brooklyn: Brooklyn Dental Pub. Co., 1929. 64 pp. Price, $1.00.

DEVILS, DRUGS AND DOCTORS. By Howard W. Haggard. New York: Harper, 1929. 405 pp. Price, $5.00.

IN TRAINING FOR HEALTH. By C. E. Turner and Jeanie M. Pinckney. New York: Heath, 1929. 151 pp. $.72.

SCIENCE AND THE WAY TO HEALTH. By J. Mace Andress and Maud A. Brown. New York: Ginn, 1929. 367 pp. Price, $1.00.

A HISTORY OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY. By Colonel P. M. Ashburn. New York: Houghton Mifflin, 1929. 448 pp. Price, $5.00.

SUNRAYS AND HEALTH. Every Day Use of Natural and Artificial Ultraviolet Light. By Ronald Millar in collaboration with Dr. E. E. Free. New York: McBride, 1929. 124 pp. Price, $1.50.

AT HOME AMONG THE ATOMS. By James Kendall. New York: Century, 1929. 318 pp. Price, $3.00.

NUTRITION AND HEALTH. (6th ed.) Helen Rich Baldwin. New York: The Borden Co., 1929. 107 pp. Apply.

STEPHEN HALES, D.D., F.R.S. An Eighteenth Century Biography. By A. E. Clark-Kennedy. New York: Macmillan, 1929. 256 pp. Price, $6.00.

YOUR NOSE, THROAT AND EARS. Their Health and Care. By L. W. Oaks and H. G. Merrill. New York: Appleton, 1929. 167 pp. Price, $1.50.

CLINICAL ASPECTS OF VENOUS PRESSURE. By J. A. E. Eyster. New York: Macmillan, 1929. 135 pp. Price, $2.50.

NURSING MENTAL DISEASES. (2d ed.) By H. Bailey. New York: Macmillan, 1929. 294 pp. Price, $2.00.

MENTAL DEFICIENCY. (5th ed.) By A. F. Tredgold. New York: Wood, 1929. 535 pp. Price, $7.50.

TRAINING SCHOOLS FOR DELINQUENT GIRLS. By Margaret Reeves. New York: Russell Sage, 1929. 440 pp. Price, $3.50.

PROCEEDINGS OF THE FIRST COLLOQUIUM ON PERSONALITY INVESTIGATION. Towson, Md.: American Psychiatric Association, 1928. 102 pp. Price, $1.00.

PRINCIPLES AND PRACTICE OF ELECTROCARDIOGRAPHY. By Carl J. Wiggers. St. Louis: Mosby, 1929. 226 pp. Price, $7.50.

BUILDING THE BABY. By Carolyn Conant Van Blarcom. Chicago: Issued by the Public Service Office of the *Chicago Tribune*, 1929. 144 pp.

CLINICAL LABORATORY METHODS. (3d ed.) By Russell L. Haden. St. Louis: Mosby, 1929. 317 pp. Price, $5.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Aseptic Nursing—The application of aseptic nursing principles in one infant ward reduced respiratory diseases only 10 per cent over a control ward, and proved of no value in preventing the spread of an outbreak of varicella.

ABRAMSON, H., and BARENBERG, L. H. Respiratory Disorders in Infants. J. A. M. A., 92, 26: 2156 (June 29), 1929.

Malarial Mosquitoes—Problems of Anopheline mosquito control in irrigated regions in the Southwest furnish the basis for an interesting discussion of the malaria danger.

BARBER, M. A., *et al.* Malaria and the Malaria Danger in Certain Irrigated Regions of Southwestern United States. Pub. Health Rep., 44, 32: 1300 (May 31), 1929.

Malaria Transmission—Examinations of mosquitoes 3 days after biting malaria victims treated with plasmochin indicate that the drug is effective in controlling the sexual forms of the malaria parasite. The combination of the drug with quinine, which controls the vegetative forms, is discussed.

BARBER, M. A., *et al.* The Effect of Small Doses of Plasmochin on the Viability of Gametocytes of Malaria as Measured by Mosquito Infection Experiments. Pub. Health Rep., 44, 24: 1409 (June 14), 1929.

Toxoid or Toxin-Antitoxin—Another contribution to the controversy. In the experience of these authors, diphtheria toxoid as prepared by Ramon given in 3 doses is superior to 0.1 L + toxin-antitoxin mixture even when 5 doses of the latter are given.

DICK, G. F., and DICK, G. H. Immunization against Diphtheria. J. A. M. A., 92, 23: 1901 (June 8), 1929.

Smallpox Prevention—A thoroughly British discussion of the subject of vaccination brought up, not because of any possible administrative question, but because of an "uncomfortable feeling that our efforts to control smallpox cannot be relied upon to attain the end to which they are directed" because of the deficiencies of health legislation.

BUCHAN, G. F., *et al.* The Control of Smallpox. Pub. Health, 42, 9: 283 (June), 1929.

"Blood Will Tell"—Examples of family trees of patients are offered as support to the belief that characteristics breed true and exert an inexorable force for good or evil. This includes disease potentialities.

DRAPER, G., *et al.* Studies in Human Constitution. J. A. M. A., 92, 26: 2149 (June 29), 1929.

Appetite Loss in Childhood—Some of the causes, natural and otherwise, for the loss of appetite by children and how the condition should be treated is the burden of this entertaining paper.

GARLAND, J. Appetite Loss in Infancy and Childhood. New England J. Med., 200, 22: 1135 (May 30), 1929.

Constipation and Health—Having heard much about but having read nothing by Arbuthnot Lane, this latest "whole-meal" dissertation—really an exhortation—about constipation was read with great glee. Women will be surprised to learn that it is constipation that makes hair grow *on* their chins and *off* their heads.

LANE, W. A. The Prevention of Constipation. Canada Lancet, 72, 6: 218 (June), 1929.

An Influenza Epidemic—An account of an imported influenza epidemic in an isolated community—a university—giving an excellent opportunity to follow its course.

MILLER, F. N. The Influenza Epidemic at the University of Oregon in the Fall of 1928. Pub. Health Rep., 44, 23: 1353 (June 7), 1929.

Poliomyelitis Control—An impartial, well-balanced summary of our knowledge of infantile paralysis giving both sides of the several moot questions associated with the disease.

MORSE, J. L. The Problem of the Control of Infantile Paralysis. New England J. Med., 200, 24: 1246 (June 13), 1929.

Streptococcus Epidemicus—Reporting bacteriologic findings of studies pursued in connection with the Lee, Massachusetts, milk-borne epidemic of septic sore throat.

ROBINSON, E. S., and BECKLER, E. A. Bacteriologic Study of Hemolytic Streptococci from a Massachusetts Outbreak of Septic Sore Throat in 1928. J. Prev. Med., 3, 3: 237 (May), 1929.

Industrial Hazards—Rather superficial consideration of some of the industrial diseases without much about practical preventive measures.

ROLLESTON, H. Industrial Diseases and Their Prevention. J. Roy. San. Inst., 49, 11: 617 (May), 1929.

Longevity—"It is difficult to find much evidence that the average physical constitution in this country today is much more hardy or more enduring than fifty, one hundred, or one hundred and fifty years ago." These words close a Connecticut study of mortality, modern and colonial. Whether *any* evidence was uncovered is not clear, for we must admit a "skimming" of the paper only.

RUSSELL, F. E., and LUCIA, E. L. A Comparison of the Mortality in a New England Colonial Town with that of Modern Times. Am. J. Hyg., 9, 3: 513 (May), 1929.

Irradiated Ergosterol—Administered in large doses irradiated ergosterol proved to be highly toxic to rabbits, a condition not applying to small doses. The inorganic phosphate content of the serum was increased as was the calcium in certain tissues.

SMITH, M. I., and ELOVE, E. The Action of Irradiated Ergosterol in the Rabbit. Pub. Health Rep., 44, 21: 1245 (May 24), 1929.

Tuberculosis Mortality—The conclusion of a study of corrected mortality statistics in New York State is that the trend of rural and urban death rates (1900–1915) was essentially the same. Since the war and influenza epidemic both rates have declined more rapidly, somewhat more so in the cities.

SYDENSTRICKER, E. The Trend of Tuberculosis Mortality in Rural and Urban Areas. Am. Rev. Tuberc., 19, 5: 461 (May), 1929.

Diet and Longevity—The extension of life expectancy is confined to the early ages, little change having been effected in ages 50 and above. The chief influence in prolonging infant lives is nutrition, according to Professor Sherman's demonstrations, which are reviewed for popular consumption.

TOBEY, J. A. Diet and the Duration of Life. Am. Mercury, July, 1929.

Iniquities of Health and Welfare Agencies—"And how often do we find on perusing the yearly reports of a lay organization that much of the funds have been expended in organization work . . . while but a very small percentage . . . have actually b e e n used to alleviate suffering!" Many will want to ask the author; how often? And the endowments dispensing medical charity are well berated, too.

VANDER VEER, J. N. The Evolution of a Health Program. New York State J. Med., 29, 12: 732 (June 15), 1929.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Pittsfield, Mass.—The 1928 report of this city of 50,100 population shows careful preparation, good printing and progress. The new *Appraisal Form for City Health Work* has been applied and the results are tabulated. The employment of a full-time bacteriologist, continued diphtheria prevention work, and additional milk inspections are among the outstanding activities of the year. There were 4 cases of measles and 24 cases of scarlet fever, with no deaths; and 31 cases of diphtheria with 2 deaths, 1 fatal case coming from outside the city. A crude death rate of 13.0 (resident 10.98), an infant mortality rate of 49.6, and a birth rate of 22.9 are recorded.

Miami County and Troy, O.—The public health staff of the city of Troy and the county of Miami function largely as a unit. It is customary for the two Boards of Health of these districts to hold a joint annual meeting to discuss future plans, to agree upon personnel, and to determine expenditures to be made by each board. The employees thus serving the boards jointly are the health commissioner, clerk, sanitary inspector, a supervising nurse and a staff nurse. In addition, each department employs other personnel for special activities.

Approximately 50 per cent of the school population is protected by diphtheria immunization. During the year, regulations were passed making it compulsory that milk from only tuberculin tested herds be sold in the county. Clinics for examination of children of preschool age were held at each graded school building during the summer, and concentrated efforts were made by the department and the Parent-Teacher Association to secure the attendance of all children due to enter school in the fall. Sanitary surveys of several districts have been made by the Rockefeller Training Station at Greenville.

The estimated population of the county health district was 26,639, and that of Troy 8,172. The county reports a crude death rate of 11.8, and the city a rate of 15.0; while the infant mortality rate of the county was 65.7 as compared with 59.6 for Troy. Gross per capita expenditures amounted to $.37 for the county and $.86 for Troy, while the per capita income from taxation amounted to $.19 for the county and $.36 for Troy.

Scott County, Ky.—In communicable disease control, the 1928 report indicates progress, and it is gratifying to observe the absence of cases of typhoid fever and smallpox during the year. A list of 49 schools indicates 100 per cent vaccination of children in all but one school, and 96 per cent of these were vaccinated. There were 6 cases of diphtheria with no deaths. It is stated that 43 per cent of the school children have been immunized and the work is going forward with a goal of 75 per cent protected before the end of the present school year.

The child hygiene program has consisted of child health conferences, home supervision by a public health nurse and talks to mothers and community groups. Eighteen conferences were held during the year with an attendance of 217. Nutrition classes have been organized in the schools.

San Diego, Calif.—This city with an estimated population of 119,700 reports for 1928 a birth rate of 22.0 and a death rate of residents of 14.2. The principal causes of death were heart disease (431), cancer (257), chronic nephritis (195), pulmonary tubercu-

losis (164), cerebral hemorrhage (123), and lobar pneumonia (116). An infant mortality rate of 48 is noted.

A public safety committee, sponsored by the automobile club, made numerous suggestions for the betterment of traffic and reduction of accidents, among which were the widening of streets, certain changes in the Uniform Traffic Ordinance, the painting of white center lines on all main streets leading in and out of the city, and additional traffic signals.

During the year 2,530 children were immunized against diphtheria, a disease which shows a decrease of 65 in reported cases over 1927, the total reported being 91. Child hygiene work has increased, and 101 welfare conferences were held with an average attendance of 19. Excellent coöperation in school work is received from the Parent-Teacher Association.

Winona, Minn.—An attractive cover, good paper, careful preparation, appropriate headings, and interesting descriptive text characterize this 1928 report of the department of health. A foreword contains the following statement:

> The phrase, "Health is a purchasable commodity," is misleading. Sometimes health lost cannot be regained at any price. The knowledge necessary to conserve health is purchasable, but it must be purchased before health is sacrificed. Healthful living is the finest art of the science of life, placing on the individual an obligation to guard his health by adhering to high moral standards of living, and a responsibility for generations yet unborn.

The milk supply comes from dairies with herds tuberculin tested annually, and physically examined quarterly. Regular inspections are made of dairy barns, equipment, and milk plants. All milk handlers and those handling milking utensils are required to have health examinations. "It is not sufficient to deliver a good quality of milk to the city. The supply must be safe at all times. All milk sold in Winona is properly pasteurized."

It is noteworthy to find in this health department report brief discussions of the importance of ventilation, recreation facilities and child health day. This city with a 1920 population of 19,143 reports for 1928 264 deaths (37 non-resident), 483 births (114 non-resident), 19 deaths of infants under 1 year of age. There were 291 births in hospitals (60 per cent), while 56 were attended by midwives. There were 6 cases of diphtheria with 2 deaths, the first cases reported in the city in over 6 years. Stress is given in the report to the importance of immunization. Commendable work in infant welfare is reported. "Winona has an infant welfare nurse with the ability to coöperate with all of the physicians. By this coöoperation and the proper community interest shown, we may hope to lower materially our 1928 record of 38 per 1,000 live births."

A. I. C. P., New York, N. Y.—The 85th annual report of the New York Association for Improving the Condition of the Poor opens with an attractive child photograph followed by impressive statistics of services under the caption "What your contributions helped us to do during the year." These include 132,076 visits made by visitors and nurses to the homes of the families and to clinics and other institutions and agencies in behalf of families. Some 21,000 visits were made to the association's dental clinics, and 142 families were assisted by the mental hygiene clinic "in an effort to understand and solve their problems."

The report abounds in attractive photographs illustrating effectively the health and welfare activities of the association. It also deserves honorable mention for the interesting descriptive text, appropriate headings and good printing.

NEWS FROM THE FIELD

HAWAII SURVEY

PROF. Ira V. Hiscock arrived in Honolulu June 11 to inaugurate for the Committee on Administrative Practice of the American Public Health Association a survey of welfare work in Hawaii. He was greeted on board ship by a welcoming committee composed of the Secretary of the Chamber of Commerce, the President of the United Welfare Board of Hawaii, members of the Territorial Board, and other prominent persons. The survey, sponsored by the United Welfare Board, will embody a study of public health and social work in all its aspects. Invitations to participate in this appraisal of health work in Honolulu were received from F. E. Trotter, M.D., Territorial Health Officer, and from the Governor of Hawaii. Prof. Hiscock has been assured complete coöperation by all of the leading public and semi-public health agencies and kindred organizations. The field work will probably require from 6 to 8 weeks.

HOUSTON FLOOD MEASURES

FOLLOWING an unusually heavy rainfall on May 30 on the small catchment area of Buffalo Bayou, which meanders through the City of Houston, the main and central pumping plant of the city water supply located on the banks of this stream was completely inundated on May 31. The entire system supplies approximately 300,000 people with an average of 30,000,000 gallons per day and one-third of this comes from the Central Plant.

Quick work on the part of the local officials and sanitary engineers of the State Department of Health and the U. S. Public Health Service brought about immediate shutting off of these units and inaugurating a comprehensive program of rehabilitation and sanitary protection. In the meantime the city system was supplied with water from the 7 outlying pumping stations not inundated by the high water, which were supplemented by numerous private wells interconnected with the system including provision for reasonable pressure for fire protection. An intensive program of cleaning, disinfecting, and laboratory testing was inaugurated and now complete chlorination of all the water is in effect. Little actual damage is recorded due to the high waters in the south Texas area, although some high water records were established.

NEVADA ADMITTED TO U. S. BIRTH REGISTRATION AREA

THE admission of Nevada to the birth registration area was recently announced by the U. S. Bureau of the Census, the bureau tests having shown that birth registration in Nevada is now at least 90 per cent complete. The only states not yet included in the birth registration area are New Mexico, South Dakota and Texas.

STATE AND PROVINCIAL HEALTH AUTHORITIES

AT the 44th Annual Conference of the State and Provincial Health Authorities of North America, in Washington, D. C., May 31 and June 1, 1929, F. E. Trotter, M.D., president of the Territorial Board of Health of Hawaii, was elected *President* for the ensuing year. Other officers elected were: *Vice-president*, E. L. Bishop, M.D., State Commissioner of Health, Nashville, Tenn.; *Secretary-Treasurer*, A. J. Chesley, M.D., Secretary of the Minnesota State Board of Health, St. Paul,

Minn.; and *Field Secretary,* S. J. Crumbine, M.D., General Executive, American Child Health Association, New York, N. Y.

New members of the Executive Committee are Matthias Nicoll, Jr., M.D., State Commissioner of Health of New York, and the retiring president of the organization, and A. T. McCormack, M.D., State Health Officer of Kentucky.

Many members remained to attend the 27th Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service. At this conference, the opening address was delivered by Surgeon General Hugh S. Cumming.

UNIVERSITY OF MICHIGAN

THE University of Michigan, at Ann Arbor, is holding a series of Public Health Institutes week-ends during the summer session, June 21 to July 27, 1929. Some of the lecturers are Marjorie Delavan, John Sundwall, M.D., Henry F. Vaughan, M.D., William DeKleine, M.D., C. C. Slemons, M.D., Lillian Smith, M.D., W. W. Peters, M.D., Louis I. Dublin, Ph.D., and many others.

THOMAS W. SALMON MEMORIAL

ANNOUNCEMENT is made by the Hon. George W. Wickersham, Honorary Chairman of the committee in charge, of the establishment of the Thomas William Salmon Memorial to provide recognition to the scientist who has made the greatest contribution in the fight against mental disease during each year. Awards are to be national and international and will provide for the wider dissemination of the knowledge of mental hygiene and insanity, through coöperation with the New York Academy of Medicine, in whose hands the administration of the $100,000 fund is to be placed.

A series of lectures will be given in various cities of the United States, to be known as the Thomas W. Salmon Memorial Lectures.

The movement was initiated by a hundred and fifty of the leading neurologists and psychiatrists of this country who have associated with them leaders in the mental hygiene movement and in psychiatric social service and nursing fields.

GREENVILLE AND DARKE COUNTY

ON June 6, 1929, Dr. M. E. Barnes resigned as Health Commissioner of Greenville, O. His resignation was presented to the Boards of Health of Greenville and Darke County at their regular meeting.

His resignation brought to a close the coöperation between the local boards of health, the State Department of Health and the Rockefeller Foundation. This coöperation was started in February, 1927, for the purposes of:

1. Developing a local health organization adequate to meet the health needs of a community
2. Expanding this work only to such a stage that the finances of the local boards of health could maintain it indefinitely
3. Using the health work thus organized and developed as a training station for health workers.

As these three objectives have been accomplished, the Rockefeller Foundation is withdrawing from the arrangement.

Dr. Barnes has been transferred to Lansing, Mich., to work with the Michigan State Department of Health. The Rockefeller Foundation is assisting this department in opening ten county health departments, as soon as they can train a staff for the work.

NEW CANCER CLINIC IN CHICAGO

A NEW clinic for cancer research will be opened in July in Chicago under the direction of many eminent doctors, among whom will be Dr. Charles Mayo of Rochester, Minn.

Final plans for the clinic were drafted

by Dr. Herman N. Bundesen, Chicago, and Anton J. Cermak, President of the Cook County Medical Board, who went to Rochester to see Dr. Mayo. The activities of the clinic will be carried out by a research staff to be assigned by Northwestern and Loyola Universities and the Universities of Chicago and Illinois.

DR. AMES NEW PRESIDENT OF JOHNS HOPKINS UNIVERSITY

JOSEPH Sweetman Ames, Ph.D., has been appointed the next president of Johns Hopkins University, Baltimore, Md., to succeed Frank J. Goodnow, LL.D., who becomes president emeritus. Dr. Ames has been connected with the university since his graduation from it in 1886.

EDWARD WILBER BERRY, DEAN OF JOHNS HOPKINS UNIVERSITY

THE new dean of Johns Hopkins University, Edward Wilber Berry, has no degree of an academic nature. He has been professor of paleontology and paleobotany at the university since 1917.

FRENCH HONOR AWARD

DR. Amedee Granger, director of the X-ray department, Charity Hospital, and director of the radiology department, Tulane University, New Orleans, La., has been awarded the gold Palmes Universitaires by the French Government, in recognition of his achievements in the science of radiology. This is the highest university decoration awarded by France and confers the title of officer of public instruction on the recipient.

HEALTH "MEASUREMENTS" IN PHILADELPHIA

THE American Physical Education Association will conduct a test in Philadelphia to "measure" the health of 10,000 school children. The purpose of this survey is to gauge the children's fitness, muscular development, neuromuscular coördination and ability to engage in healthful recreation.

NEW OFFICERS OF DELTA OMEGA

HON. Herbert Hoover, President of the United States, has recently been elected an honorary member of Delta Omega; Surgeon General Hugh S. Cumming and Dr. Frederick F. Russell were also honored in the same way. Dr. Charles V. Chapin is the only other honorary member of this society.

ILLNESS IN NEW YORK

THE Welfare Council, set up with grants from the Laura Spelman Rockefeller Memorial and the Commonwealth Fund, has published the results of a two-year health inventory, which reads in part as follows:

There are in New York City 125,000 to 200,000 persons ill in bed every day, and two to four times as many ill though not incapacitated. Several thousand die each year, many from preventible causes.

The yearly cost of care for the sick—doctors, hospitals, nurses, clinics, drugs, healers and appliances—is $150,000,000. The loss in wages due to absence from work on account of illness is $75,000,000 a year, and there is an even greater loss because of diminished productivity and other results of illness.

New York has 11,000 physicians, 12,000 nurses, 6,000 dentists, and 200 hospitals.

The rating of public health work in New York is 709 out of a possible 1,000 points on the American Public Health Association *Appraisal Form for City Health Work*, but this rating scale was devised chiefly for use in smaller cities and should not be taken as perfect for New York.

Copies of the complete report can be obtained from the Welfare Council of New York, 151 Fifth Avenue, New York, N. Y.

MICHIGAN PUBLIC HEALTH ASSOCIATION

THE midsummer meeting of the Michigan Public Health Association was held July 20 at the University of Michigan, Ann Arbor.

OUR IMMIGRANT FOODS

THE National Dairy Council has prepared an interesting item, showing where some of our food originated. Here is where some of them first came from:

Celery from Germany.
Onions from Egypt.
Pears and apples from Europe.
Spinach from Arabia.
Walnuts and peaches from Persia.
Cucumbers from East Indies.
Quince from Crete.
Radishes from China and Japan.
Peas from Egypt.
Horse-radish from southern Europe.
Ice cream from Italy.

PERSONALS

M. P. RAVENEL, M.D., University of Missouri, Fellow of the A. P. H. A. and Chairman of the Editorial Board of the *American Journal of Public Health and The Nation's Health*, was recently made an honorary member of Phi Beta Kappa at The University of the South, Sewanee, Tenn.

DR. EMMET F. CASEY has been appointed health commissioner of the village of Hillside, Ill.

DR. WILLIAM H. WELCH has resigned from the State Board of Health of Maryland after 31 years of association with it. Dr. Thomas S. Cullen has been appointed by the governor to take Dr. Welch's place.

DR. CURTIS H. LOHR has been appointed hospital commissioner of St. Louis, Mo., to succeed Dr. J. W. Shankland.

DR. THEOBALD SMITH retired on June 30 from the directorship of the department of animal pathology of the Rockefeller Institute for Medical Research. Dr. Carl Ten Broeck became the acting director in his place.

MRS. SIDONIE MATSNER GRUENBERG, director of the Child Study Association of America, sailed on June 7, to attend the Home and School Conference in London held June 28 and 29.

ARTHUR B. EMMONS, 2D, M.D., has recently become Executive Director of the Boston Metropolitan Chapter, American Red Cross, 45 Newbury Street, Boston, Mass.

DR. SHERMAN S. KATHAN, of Conklingville, N. Y., Health Officer of the Townships of Hadley and Day for twenty-five years, died in the Albany Hospital on May 12. He was the only physician in Conklingville.

DR. WILLIAM J. FLEMING, Health Commissioner of Troy, N. Y., since January, 1928, died on May 19.

GROVER A. WHALEN, Commissioner of Police of New York, N. Y., addressed the public over the radio on June 8 on "Enforcement as an Aid to Safety."

MAGNUS W. ALEXANDER, president of the National Industrial Conference Board, New York, N. Y., sailed for the Netherlands, to address the Fifth General Congress of the International Chamber of Commerce at Amsterdam, Holland, July 9.

GEORGE A. SOPER, PH.D., Consulting Sanitary Engineer, sailed on June 22 for Liverpool, England, to investigate the organization, methods and apparatus used by foreign cities in the collection and disposal of wastes. He will visit England, France, Germany, Austria and Italy.

DR. JAMES H. FLYNN was appointed Health Commissioner of Troy, N. Y., to succeed Dr. William J. Fleming, who died recently.

ALBERT L. MORGAN, Health Officer of Dexter, N. Y., for over 35 years, died on May 19.

IVAN C. WELD, Secretary-Treasurer of the International Association of Dairy and Milk Inspectors, died on March 15.

CONFERENCES

Sept. 26–28, Association of Military Surgeons of the United States, Denver, Colo.

Sept. 30–Oct. 5, American Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, American Child Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, International Society of Medical Health Officers, Minneapolis, Minn.

Sept. 30–Oct. 5, American Association of School Physicians, Minneapolis, Minn.

Sept. 30–Oct. 5, Northwest Conference of Child Health and Parent Education, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Sanitary Conference, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Organization for Public Health Nursing, Minneapolis, Minn.

Sept. 30–Oct. 5, American Social Hygiene Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Conference of State Laboratory Directors, Minneapolis, Minn.

Sept. 30–week, National Safety Council, Chicago, Ill.

Oct. 14–18, American College of Surgeons, Chicago, Ill.

Oct. 24–26, International Association of Milk Dealers, Toronto, Can.

FOREIGN

Aug. 22–29, Adult Education Conference, Cambridge, England.

Oct. 16, International Conference for the Revision of International Classification of Causes of Sickness and Death, Paris, France.

Summer Problem No. 3—DIARRHEA



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Maternity as a Public Health Problem*

MATTHIAS NICOLL, JR., M. D., FELLOW A. P. H. A.

Commissioner of Health, State of New York, Albany, N. Y.

BEFORE the advent of what is commonly called modern public health, health administration was comparatively simple; its field was narrow; and the duties and prerogatives of health officials were generally accepted without dispute, not only by the public but by the medical profession.

With the constant expansion of the field of public health, due to popular demand, unquestionably stimulated and rendered vocal and effective by the activities of official and nonofficial health agencies, the administration of public health is becoming increasingly difficult, largely because the borders of the field are continually impinging on the rights and prerogatives, real and fancied, of other official and non-official agencies. This leads to frequent disputes, bad feeling, lack of coöperation, working agreements, and all sorts of more or less futile compromises. Yet the health official, who seeks to limit his work to the quarantine and control of infectious diseases, the protection of water and food supplies, and such matters of routine as daily come to his attention, can hardly expect to keep abreast of the demands of modern life.

It is safe to say that the average health officer does not of his own volition seek to enlarge greatly the scope of his activity. Most of them would prefer to perform more efficiently the fundamental and essential work of their office with the production of more immediately measurable results than is usually possible in the majority of the newer fields; but the powers and responsibilities conferred by law upon health officers of larger jurisdictions are so far reaching and inescapable

* Presidential Address delivered before the State and Provincial Health Authorities of North America at the 44th Annual Conference at Washington, D. C., May 31, 1929.

that they cannot be avoided with self-respect and a sense of obligation to the oath of office.

Among the more recent activities in which health officers must engage may be mentioned the control of venereal disease, cancer, well baby clinics, periodic health examinations, and the reduction of maternal mortality. I have chosen the latter as a basis for some general observations—not that it is by any means the most important branch of public health, but because it presents a problem which includes possibly as many controversial elements as any of the others mentioned, and because no other phase of public health has produced more widespread discussion throughout the nation, or more heated arguments pro and con, than that of the care of the pregnant woman, involving as it does questions of federal and state financial policy, political expediency, personal prejudices, authority for the conduct of the work, and, most important of all, the control of methods of medical practice in the home and hospital.

Briefly stated, what is the problem which we as health officers are called upon to solve? In the 40 states and the District of Columbia, comprising the registration area for 1927, 13,837 women died from causes directly connected with childbirth. From a statistical standpoint, the figures themselves are not startling compared with those for the principal causes of death, but when the fact is taken into consideration that we are dealing not with a disease but with a physiological process, they are most disheartening, and a reproach to public health administration and its frequently vaunted claims of rapid progress in the achievement of definite results.

The deaths annually of 14,000 or 15,000 women from causes directly connected with childbirth, and the chronic invalidism of many times that number, constitute a much graver problem than an equal number of deaths among the general population or among infants and young children, since in a large number of cases the death of a woman in childbirth involves the disruption of a home, the future welfare of many dependent children, and other sociologic and economic factors, with which it is frequently very difficult to deal.

The definite recognition of maternal mortality as a public health problem in this country can be said to date from the enactment of the Sheppard-Towner Act, by which funds were made available to the states for work in maternity and child hygiene. Before that time little was done for the welfare of the expectant mother except in a few large cities and by unofficial organizations. During the last five years with greatly increased financial resources within the states, directly and indirectly as a result of the federal act, and an immensely aroused

public interest, especially among representative American women, the work has gone forward with a degree of success which is not easily estimated—certainly not statistically—and yet only the most prejudiced critic would dare to assert that no progress has been made toward the solution of what is and for a long time will be an extremely difficult problem.

As good Americans, we claim and frequently exercise the inalienable right to criticise and condemn our own shortcomings as a nation, and in this spirit most of us at one time or another in our moments of oratorical inspiration have called upon our audiences to witness the disgraceful neglect of expectant mothers prevailing throughout this country, resulting in a higher maternal death rate than in most of the civilized nations. This fact would seem to be proved statistically, and yet before permitting ourselves to indulge in too violent self-condemnation, let us be certain that the figures of other countries are as accurate as ours, and based on identical methods of allocating causes of deaths. Furthermore, those countries that show the lowest maternal death rate are very small in area compared with the United States, and contain a much more homogeneous population than that with which we have to deal. No nation, except ours, is called upon to face such a racial variation in fitness for motherhood. It can hardly be supposed that maternity work in certain states in the northwest is accountable for the low maternal mortality as compared with that of most other states; it is rather the physical development and habits of people of Scandinavian blood, among whom in their mother country the maternal death rate is exceedingly low, and, incidentally, lower than among the immigrants of that race and their descendants in this country.

In a recent pamphlet published by the Maternity Center Association of New York, N. Y., the problem with which we are confronted is summed up as follows:

> In the United States there are:
> 3,026,789 square miles of territory
> Whole communities without roads
> Wide stretches of territory without doctors
> 1,900 counties without a public health nurse (almost one-half of the counties in the United States)
> At any given time more than 2,000,000 pregnant mothers distributed over this vast territory.

Let me point out other inherent difficulties which we as health officers are facing, and will have to face for many years to come. I had hoped to present an analysis of the facts regarding some 3,000 maternal deaths in the State of New York, based on a questionnaire sent

out to all the physicians in the state in whose practice such deaths had occurred. Unfortunately tabulation of the results has proved much more time consuming than was at first anticipated. It may be of interest, however, to record the fact that more than 80 per cent of the physicians who were asked to fill in this confidential questionnaire responded promptly and fully—a splendid example of coöperation between the medical profession and public health authorities. The same kind of questionnaire sent to the various hospitals received far less consideration. A preliminary analysis of 696 replies received for the year 1925 brought out these facts among others:

Of the 696 cases, hospital care had been involved in 74 per cent, about half of which were delivered and died in the hospital, and the rest delivered in the home but died in the hospital later.

Only one-third of these cases reached full term; one-fifth were under 5 months gestation.

The lapse of time between the delivery and the death of the mother was as follows: In one-fifth of the cases death and delivery were practically simultaneous; in one-fourth there was a lapse of from 1 to 5 days between delivery and death; in one-fifth 6 to 14 days, and in one-eighth 16 to 50 days.

As to nationality—75 per cent were American born, 9 per cent Italians, and 4 per cent Poles.

Over 5 per cent were illegitimate births.

There were 230 questionnaires which stated at what stage the patient had entered the hospital. Only 13 per cent entered before delivery, 37 per cent during labor, and 50 per cent after delivery.

What chance did the doctors have as indicated by the number of days under care before death? To this question there were 483 replies. Fifty per cent had the case 1 week or less; over 10 per cent had the case less than 1 day; the balance were under care for varying periods, but only 13 cases were reported as having been carried the whole 9 months.

Only 16 cases were reported as having been delivered by a midwife, but others had a midwife in attendance at some time. A midwife was involved in 1 death, but was later exonerated.

As to prenatal care, 41 per cent failed to answer. Of the 408 answers, 65 per cent reported *Yes;* 35 per cent reported *No.* From the meager information as to the details of prenatal care, it was most difficult to gauge the effectiveness of such care. Judged by the generally accepted standards—the minimum standards as issued by the State Department of Health some five years ago—it would appear that few cases had enjoyed what might be termed adequate prenatal care. An attempt to ascertain when such care began showed that 34 per cent did not have prenatal supervision until the 7th, 8th or 9th month.

The most important fact to be derived from this analysis is that 74 per cent of these patients had been hospitalized, but that half of them had been delivered before going to the hospital, and later died therein. This represents a very high degree of emergency, with the

inevitable conclusion that the patients received little medical supervision until it was too late.

During the hearings on the Newton Bill before the Committee of Interstate and Foreign Commerce of the 70th Congress, the remarks of Dr. George W. Kosmak of New York were especially interesting. He represented, I believe, the state medical society, and is incidentally one of the dozen consulting obstetricians whose services the State Department of Health placed at the disposal of the county medical societies of the state by the use of federal funds. The object was the imparting by lectures and demonstrations to the general practitioners of the state an up-to-date knowledge of obstetrical procedures. Dr. Kosmak expressed the opinion that the work in maternal hygiene, as conducted in the various states under the provisions of the Sheppard-Towner Act, dealt too largely with what he regarded as the nonessentials of the problem, namely, prenatal care and instruction; that the question was largely one of obstetrical practice; and that failure to obtain more striking results in the diminution of maternal deaths was due in a large degree to bad obstetrical procedure. With the latter part of this statement I think most of us will agree; but that good prenatal and postnatal care cannot be characterized as a nonessential is adequately proved by the results which have followed well organized work in this field.

Through the courtesy of the Child Health Demonstration Committee of The Commonwealth Fund, I am permitted to call attention to the work of that organization in Clarke County, Ga., and Rutherford County, Tenn., from 1925 to 1928. This involves a group of some 5,000 women, approximately proportioned 2 to 1 as regards white and colored. Of these, 1,271 were under maternity care and 3,755 not under maternity care supervised by the health department. The maternal mortality per 1,000 live births in the combined group of white and colored, supervised and not supervised, was 9.4 (5.9 among the white, 16.4 among the colored); in the whole group not under official supervision 11.2 (6.9 among the white and 20.9 among the colored); under maternity care 3.9 for the whole group (2.6 among the white and 6.0 among the colored).

The cases under supervision in relation to maternal deaths include those visited by health department nurses for prenatal and, in most instances, for postnatal care. This is a striking example of what may be accomplished by thorough-going prenatal care, and presumably does not include supervision over the kind of obstetrical practice which these women received.

For what they are worth, data are submitted of the results among

approximately 1,000 expectant mothers attending the prenatal consultation clinics held by the New York State Department of Health during the past 5 years. By these it is shown that the mortality among mothers who visited these clinics was 14.6 per cent lower than the general puerperal mortality rate of the state, exclusive of the City of New York. The total number of deaths in this group was so small, however, that the figures in themselves cannot be regarded as of any great significance. Numerous other examples could be quoted of efficient and persistent prenatal and postnatal supervision which have produced definite results in lowering maternal mortality.

To return to the question of the practice of obstetrics as influencing maternal mortality—while undoubtedly the lives of a great many pregnant women are sacrificed annually in this country through the inaccessibility of medical care, or the entire lack of it, when the fact is considered that a large part of these deaths—certainly more than half—occur in cities and communities where doctors *are* available and *do* take charge of such cases, it is essential that the methods of obstetrical practice in this country be taken into account, however difficult it may be for health officers to ascertain the facts regarding them.

No one will question the oft-repeated statement, especially by members of the medical profession, that the teaching of obstetrics in most of our medical schools is totally inadequate. In many the instruction and experience afforded students is far less than that required of midwives in those states which supervise their work and license them. Indeed in some of our medical schools the faculties have not departed from the original conception that the practice of obstetrics is hardly a man's job, and can be mastered apparently by inspiration or after the observation of a few normal cases, in the actual delivery of which the student takes no part. The medical schools must then be held directly responsible for the kind of obstetricians which are being turned out in many parts of the country.

On the other hand, there has arisen of late years a school of meddlesome obstetrics founded on the practice and teaching of certain unquestionably skilled obstetricians, the popularity of whose practice is undoubtedly based on the very natural desire of women to be relieved in so far as possible of the sufferings of childbirth—even though among the more intelligent there must be knowledge of the additional risk to their lives and health, as well as to the children. These men have little or no regard for the processes of parturition which nature has perfected and which cannot be improved upon in a vast majority of cases. Yet some of them as a matter of routine resort to artificial methods of manual delivery; use instruments; and perform Cesarean

operations on the slightest provocation, or with none at all. I have had occasion to analyze the results of this kind of practice and, for one, am ready to state that in the broader sense it constitutes malpractice, even though it cannot be legally so adjudged.

As health officers, we are helpless to remedy this condition of affairs, and it is time that the organized medical profession should be empowered by law and stand ready to clean house in the interest of the lives and health of prospective mothers in this country. If they do not do so, the health authorities will be obliged to perform the task with a weapon, always at their command—pitiless publicity.

In the study that I have had prepared by the New York Division of Vital Statistics of death rates from specified puerperal causes in the original birth registration area from 1915 to 1925, omitting the years 1918, 1919 and 1920, which showed abnormally high rates owing to the prevalence of influenza, the following facts are elicited:

The death rate per 10,000 live births, due to accidents of pregnancy, increased on the average 2.4 per cent annually.

From puerperal hemorrhage 1.5 per cent.

Other accidents of labor 2.9 per cent.

Puerperal phlegmasia alba dolens, embolus, sudden death, 5.2 per cent, while deaths from puerperal albuminuria and convulsions decreased 2.0 per cent, and puerperal septicemia 0.9 per cent.

Incidentally, it may be stated that the mortality of infants from injuries at birth for the 10-year period 1915 to 1925 has risen on an average 3.6 per cent annually. If these figures mean anything—and they are based on a sufficiently large number of cases to be significant—they represent the results of meddlesome and unskillful obstetrical practice.

While progress is slow, the trend of maternal mortality in this country since the beginning of the campaign is definitely downward. The work of reducing maternal mortality differs widely from such procedures as immunizing the population against diphtheria; protecting a community against a water-borne outbreak of typhoid fever; or controlling infant mortality partly by means of the supervision of the milk supply. It is and always will be a more or less piecemeal affair. The cases are widely scattered throughout the country, and the conduct of a campaign must be based not only on general principles affecting the whole problem, but on racial peculiarities, and numerous other local conditions.

It is well to point out the fact that very little work is being done in the greater centers of population where, of all places, facilities should be at hand capable of producing definitely good results. It is

also of immense importance that knowledge should be forthcoming as to the kind of obstetrical practice afforded by hospitals of various types. Here again, the medical profession must assume the task in large measure. It will require independence, unselfishness, and a much greater indifference to that much abused term "medical ethics" than has hitherto prevailed. The work of public health education in regard to maternity must go on and be more effectively developed. Notwithstanding the criticisms to which it is constantly subjected it has produced and will continue to produce far-reaching results.

Many years ago Dr. Abram Jacobi of New York delivered an address in classic Latin before the Roman Medical Congress. If I remember correctly, he deprecated the then growing tendency to perform operations on the brain for the relief or cure of various pathological conditions. The title of his paper was *"Non Nocete"* (Do no Harm), an admonition which those who are responsible for the care of the expectant mother may well take to heart.

Tolerance

THERE is a limit beyond which abuse, misstatement, intolerance, and destructiveness must not be allowed to go. I hold no special brief for the medical profession. I realise that doctors, like the rest of us, have their failings. I am aware that privilege and vested interest may make some of them—sometimes—as selfish and intolerant as any. I tell them this at intervals, and admit, as greatly to their credit, that in spite of my abuse they continue to treat me with great friendliness and consideration; perhaps they do not take it too seriously.

Gratitude, however, for that friendliness is not the reason why I stand here today to defend them and their colleagues in the laboratories. Rather is it a sense of urgent necessity. When the beneficent work of the Medical Research Council is publicly denounced by a presumably responsible priest, when the use of radium, in the treatment of cancer, is openly described as an imposture by a qualified medical man who claims to have investigated it, and found it worthless forty years ago (9 years before it was discovered!), when the public is implored not to subscribe to hospitals lest its money be spent in torturing rabbits and guinea-pigs, when the greatest of human quests—the search for knowledge for the alleviation of suffering—is held up to obloquy by persons incapable of understanding or appreciating the beginning of what it means, then it is time for a counter-attack to be made.

. . . I do not propose, however, today to discuss only the fantastic opposition of the antivivisectionists. Their attitude of mind is only one aspect of a general phenomenon well known throughout history, a mild form of mental disorder, if you will, but one which has expressed itself from time to time in various hideous forms; in cruelty and persecution, in hatred and malice, in the perpetual treachery of hindering mankind in his slow and pathetic efforts to climb the ladder of civilisation.—A. V. Hill. From *The Lancet*, June 29, 1929, p. 1385.

Precision and Reliability of Underweight Measurement

C. E. TURNER, DR. P. H., FELLOW A. P. H. A.

Professor of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

THERE are two reasons for weighing school children. The first is the educational purpose of interesting the child in growing. It rests upon the realization that growth is a natural and continuous process and that the growth rate of children with good health and hygienic practices is better than that of children who are sick or who live unhygienically. The second reason for weighing school children has been to determine, in some degree, their health status by examining their height-weight ratio.

We are here concerned with the latter procedure, but it is desirable to point out at the beginning that the first or educational procedure is entirely separate from the second. It furnishes one of the best child incentives in the health education program and would continue to be useful even if the height-weight ratio as an index of health should be abandoned.

Can we assume that a child who is 10 per cent or 7 per cent below average weight for height and age is subnormal in nutrition or in health?

Can and should all children be brought out of this underweight group?

Can the effectiveness of a school health program be measured by the reduction in the number of underweight children?

These are important questions in determining certain phases of school health procedure. An examination of the nature and precision of the underweight measurement will help to answer them.

Children of the same height and age vary in weight for two reasons. The first is a difference in heredity, in nature, in skeletal proportions. The second is a difference in the amount of flesh, in nurture, a tendency toward emaciation or obesity—abnormal variations which are related to health or nutritional status. The presumption in the diagnostic use of underweight is that the underweight child has fallen below those variations which could be produced by the first

cause, and, therefore, must have something wrong with his health or nutrition.

AVERAGE WEIGHT—HOW ARE TABLES MADE?

Many standard weight tables have been made and an examination of these will show that each indicates a different average weight for boys or girls at each particular age. For example, 36 different tables give 33 different figures, ranging from 29 to 34.4 kg. as the average weight for boys 11 years old. In other words, when sets of tables are made the makers do not arrive at the same average weights.

We shall consider here the Baldwin-Wood tables. They were made from measurements of supposedly healthy children.* The process of making the tables includes, first, the weighing of many children without clothing and the determination of the average weight for each age-height group. A reasonable weight is then added for clothing and the resulting "average weight" is stated in terms of the nearest whole pound. (School people would do well to use the term "average weight" instead of "normal weight" whenever they refer to this figure because it is the average weight of a group of healthy children and does not indicate the weight which would be "normal" or "most desirable" for any particular child.)

Dr. Baldwin was good enough to send me some of the basic data from which his tables were made. Table I shows the number of children used in each computation. Table II shows the mean weights found for three age groups (7, 11, and 15 years) and the average deviations from these means. It will be seen, for example, that the average 11-year old boy varies from 2.6 to 10.2 lb. on one side or the other of the figure in the table according to the height group to which he belongs. Expressing such figures in terms of a percentage of the average weights we find that the average healthy 7-year old child varies from the mean by about 6 per cent, the 11-year old child by about 8 per cent, and the 15-year old child by nearly 10 per cent. Girls vary more than boys.

It seems apparent that a 7 per cent drop in weight below this average should not be considered as an indication of malnutrition since many supposedly healthy children show a variation as great as that. To be sure, some of these vary above the line, but an appreciable number in the Baldwin-Wood measurements must have been more than 7 per cent below the average weight. Variation in weight increases with age and one must expect to find many more 10 per cent underweight children among those 15 years old than among those 7 years old.

* No objective tests of health status were used in selecting the children measured.

We find, then, that the table does not indicate what a particular child should weigh, but an average weight from which healthy children vary rather widely.

In computing a child's relationship to average weight, his age to the nearest year and his height to the nearest inch are taken. One then looks up the average weight for the sex, age, and height as recorded in the table. The child's actual weight to the nearest pound is then divided by this figure and we say he is such a per cent of average weight. Whole units are used and this reduces precision.

The Age Factor—Ordinarily age is taken to the nearest birthday. Suppose a child is 10 years and 5½ months old on January 1; on February 1 he is 10 years and 6½ months. For purposes of computation his age has increased 1 year; actually it has increased 1 month. In schools where age as of a particular day in the calendar year is used, all children are underaged or overaged at particular weighing periods.

What difference will underaging or overaging make in the "per cent of average weight"? That may be determined for any particular case by referring to the Baldwin-Wood tables. The effect of underaging or overaging children under 8 years of age is slight, but after that time the number of children affected increases, and after 13 years

TABLE I

DISTRIBUTION OF CASES USED IN BALDWIN-WOOD WEIGHT-HEIGHT-AGE TABLES

Boys

Height Inches	Age, Years 6	7	8	9	10	11	12	13	14	15	16	17	18
40.5–41.4	2												
41.5–42.4	4	1											
42.5–43.4	14	6											
43.5–44.4	28	7	2										
44.5–45.4	35	25	8	3									
45.5–46.4	45	47	12	6									
46.5–47.4	50	55	27	7	2								
47.5–48.4	17	86	75	22	10								
48.5–49.4	16	71	78	41	17	5							
49.5–50.4	3	48	110	80	37	7	3						
50.5–51.4	2	28	97	104	75	28	9	2	1				
51.5–52.4	2	12	72	143	115	55	19	2		1			
52.5–53.4		4	39	120	161	102	38	11	1				
53.5–54.4			23	100	170	154	64	27	5		1		
54.5–55.4		1	14	59	154	186	108	45	12	2			
55.5–56.4			4	38	116	211	175	65	23	1			
56.5–57.4			1	15	82	157	190	127	45	10	1		
57.5–58.4				9	43	125	203	165	64	22	2		
58.5–59.4				2	18	87	157	167	85	23	2		
59.5–60.4				1	11	49	121	172	130	56	13	1	
60.5–61.4					3	23	89	159	129	61	19	7	1
61.5–62.4					1	15	41	126	132	80	36	9	7
62.5–63.4						3	29	82	148	100	29	9	4
63.5–64.4						2	10	74	134	107	55	23	5
64.5–65.4							4	31	98	133	86	38	16
65.5–66.4							3	26	69	124	122	56	23
66.5–67.4							1	6	48	106	99	90	47
67.5–68.4								4	41	76	126	96	42
68.5–69.4								3	16	55	91	74	42
69.5–70.4								1	7	35	53	57	42
70.5–71.4									5	19	36	22	15
71.5–72.4										3	18	24	16
72.5–73.4									1	2	13	10	13
73.5–74.4									1	1	3	4	3
74.5–75.4												2	
Total No.	218	391	562	750	1,015	1,209	1,264	1,295	1,195	1,017	805	522	276

of age a change of 1 year in age would affect the "percentage normal" weight of the majority of children.

We have taken the trouble to compute the effect upon the "percentage normal" weight produced by overaging and underaging 1 year for boys and for girls at different age levels. Table III shows the maximum and minimum change in per cent from overaging 1 year at each age level. It may be as little as 0.75 per cent, or as much as 5.7 per cent. This tells us also the change which would be made in the percentage normal weight of a child who is given credit for being a year older when actually he is only a few weeks older. In other words, a child may become as much as 4 per cent or 5 per cent more underweight the day he becomes a year older. All children are not equally affected and Table III has, in the last column, a statement of the extent to which a whole population of children would be made underweight if they were overaged 1 year.

The Height Factor—What about changes in height? We use height to the nearest inch in computing the child's percentage of average weight. One often finds a child half way between the inch marks and wonders whether he should indicate the child's height as the lower inch or the higher inch in making the computation. How much difference does it make? What happens to a child's underweight status when he gains ¼ inch and gets credit for gaining a whole inch? By making sample computations from the Baldwin-Wood table it is found

TABLE I (*Con.*)

DISTRIBUTION OF CASES USED IN BALDWIN-WOOD WEIGHT-HEIGHT-AGE TABLES

Girls

Height Inches	Age, Years												
	6	7	8	9	10	11	12	13	14	15	16	17	18
40.5–41.4	3	1											
41.5–42.4	17	1											
42.5–43.4	31	11											
43.5–44.4	49	14	1										
44.5–45.4	60	43	15										
45.5–46.4	60	91	27	6		1							
46.5–47.4	43	102	68	16	1								
47.5–48.4	18	92	104	48	10		1						
48.5–49.4	14	63	122	86	24	1		1					
49.5–50.4	2	40	142	128	72	15	1	2					
50.5–51.4		26	102	169	100	33	4		1				
51.5–52.4		9	59	155	164	78	20	2					
52.5–53.4		2	41	139	204	120	23	2	3				
53.5–54.4		2	22	85	181	163	74	10	2	2			
54.5–55.4			2	58	180	219	112	23	2	1			
55.5–56.4			2	37	104	202	139	58	2		3		
56.5–57.4				6	67	144	193	90	22	2	3	1	2
57.5–58.4				3	37	144	186	110	46	13	1	1	2
58.5–59.4					16	90	155	135	74	25	12	7	1
59.5–60.4					3	66	160	214	140	77	33	23	7
60.5–61.4					1	37	131	208	175	154	94	50	25
61.5–62.4						9	83	198	225	176	148	91	56
62.5–63.4						5	53	140	215	214	178	125	59
63.5–64.4							15	84	168	177	175	136	57
64.5–65.4							8	62	115	136	127	94	55
65.5–66.4							3	26	66	83	80	85	35
66.5–67.4								8	32	45	64	51	20
67.5–68.4									14	19	20	23	14
68.5–69.4									2	12	13	10	6
69.5–70.4										2	4	4	2
Total No.	297	497	707	936	1,164	1,327	1,361	1,373	1,304	1,138	955	701	341

TABLE II

MEAN DEVIATION BASED ON MEASUREMENTS USED IN WEIGHT-HEIGHT-AGE TABLES

Boys

7 Years					11 Years					15 Years				
Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %	Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %	Hgt. In.	No. of Cases	Av. Wgt.	Mean Dev. Lb.	Mean Dev. %
44	7	44	2.4	−5	51	28	61	2.6	4	58	22	87	10.3	12
45	25	46	2.2	−5	52	55	64	5.2	8	59	23	90	4.3	5
46	47	48	2.4	5	53	102	67	4.3	6	60	56	95	8.1	9
47	55	50	2.5	5	54	154	70	4.8	7	61	61	100	7.5	8
48	86	53	3.0	6	55	186	73	5.6	8	62	80	104	8.3	8
49	70	55	3.6	7	56	211	77	6.0	8	63	100	110	8.8	8
50	48	58	2.9	5	57	157	81	7.4	9	64	107	110	9.2	8
51	28	61	6.2	10	58	125	84	7.7	9	65	133	120	8.8	7
52	12	63	4.2	7	59	87	88	7.9	9	66	124	125	10.1	8
					60	49	92	9.0	10	67	106	130	9.5	7
					61	23	95	10.2	11	68	75	134	8.6	6
										69	55	139	8.6	6
										70	35	144	13.8	10
										71	19	150	8.8	6
					Girls									
43	11	41	2.9	7	50	15	61	3.3	5	58	13	96	10.2	11
44	14	42	2.5	6	51	31	63	6.3	10	59	24	100	11.5	12
45	43	45	3.6	8	52	76	65	4.4	7	60	76	105	10.8	10
46	89	47	2.6	6	53	120	68	5.6	8	61	154	108	11.3	10
47	101	50	3.1	6	54	161	71	7.1	10	62	176	113	11.5	10
48	92	52	3.8	7	55	212	74	6.6	9	63	212	116	11.0	9
49	58	54	4.1	8	56	199	78	8.2	10	64	175	119	11.9	10
50	43	56	2.8	5	57	166	82	7.2	9	65	140	122	11.9	10
51	25	59	3.2	5	58	142	86	9.9	12	66	83	125	15.9	13
52	9	63	5.0	8	59	90	90	10.5	12	67	45	131	14.4	11
					60	66	95	9.7	10	68	19	135	12.8	9
					61	35	99	9.9	10					

that an added inch in height increases the extent of underweight by about 4 per cent. The use of whole inches may make an underweight figure inaccurate to this extent.

The Weight Factor—Weight is usually computed to the nearest quarter pound, but used as the nearest whole pound in making the com-

TABLE III

EFFECT OF OVERAGING GIRLS ONE YEAR

Age	% of Girls of this Age at Heights (Burke) which Show Variation in Weight from One Year Older (Baldwin-Wood)	Minimum Change in % Underweight of Any Girl	Maximum Change in % Underweight of Any Girl	% Underweight Change of All Girls
5	0.1	2.00	2.00	0.002
6	0.0	0.00	0.00	0.000
7	18.0	1.49	2.08	0.360
8	9.7	1.43	2.70	0.165
9	55.9	1.47	2.56	1.004
10	56.5	1.41	4.20	1.281
11	72.0	0.95	3.08	1.477
12	83.5	0.87	2.82	1.993
13	89.6	0.83	5.38	3.189
14	89.8	0.76	4.35	3.067
15	94.3	0.73	4.94	2.119
16	91.6	0.78	1.71	1.225
17	84.6	0.69	2.57	0.998

EFFECT OF OVERAGING BOYS ONE YEAR

Age	% of Boys of this Age at Heights (Burke) which Show Variation in Weight from One Year Older (Baldwin-Wood)	Minimum Change in % Underweight of Any Boy	Maximum Change in % Underweight of Any Boy	% Underweight Change of All Boys
5	0.5	2.00	2.00	0.010
6	3.4	1.72	1.89	0.063
7	0.5	1.49	1.56	0.008
8	0.1	1.31	1.31	0.001
9	1.9	1.19	1.37	0.025
10	1.1	1.09	1.23	0.014
11	40.1	0.94	1.47	0.556
12	32.3	0.93	2.56	0.399
13	58.7	0.93	3.12	0.733
14	62.6	0.70	2.50	0.959
15	72.0	0.66	2.98	1.668
16	89.1	0.64	4.25	2.653
17	95.2	1.18	4.30	2.567
18	94.2	0.58	3.15	2.512

putation. Suppose you have a child just on the border line between one pound and another. If you choose the lower pound for your computation, he will be nearer up to weight than if you choose the upper pound, and the extent of the change in "percentage normal" weight will be represented by the fraction $\frac{1}{\text{the average weight}}$ which will usually amount to 2 per cent for younger children and 1 per cent for older children.

Combination of Factors—It is easy to secure from our data instances in which the whole units have combined either for or against an individual child. For example, one boy in January, 1921, was 100 per cent of average weight, or exactly normal. He grew at the expected or average rate in both height and weight, but because he slipped over certain whole units of computation though not over others, in January, 1922, he was found to be 94.3 per cent, or 5.7 per cent below average weight.

In another instance a girl who, in June, 1921, was 89.1 per cent of normal weight or nearly 11 per cent underweight, grew in both height and weight at the normal rate. Because of the accident of computation she was 96.8 per cent, or only 3.2 per cent underweight in April, 1922, and if we had used her height for a previous month, as is done in some schools, she would have been exactly normal weight although her body proportions could not have changed appreciably since her rate of growth in both weight and height was average. These differences arise because of the crudity of the measure.

Group averages of "per cent normal weight" are more consistent than individual figures, and yet if the individual determinations are crude so that they jump up and down from month to month, then obviously the averages are less significant because the individual variations are wide.

Shoes—Another factor which enters into the statistics issued by different school departments is that of shoes. In some schools children are weighed and measured with shoes; in other schools they are weighed and measured without shoes. We took the trouble to weigh 1,000 children* with shoes and without shoes, and Tables IV and V indicate the maximum, minimum, and average changes found.

For most children the percentage of average weight is greater when weighed and measured without shoes. That is, children in shoes are really like children on stilts. They seem taller and thinner. An inch of shoe does not weigh as much as an inch of boy. Therefore, the computation of the boy's relationship to normal weight shows him to

* Thanks are due to supervisors and teachers in Malden and Newton for making this possible.

TABLE IV

RELATION OF INDIVIDUALS TO "NORMAL WEIGHT" WITH AND WITHOUT SHOES

Age	No. in Group	Maximum Increase in % Normal when Shoes Are Removed	Maximum Decrease in % Normal when Shoes Are Removed	Children Showing No Change in % Normal	
				No.	% of Group
Boys					
6	62	8	4	1	1.7
7	59	6	2	8	13.6
8	58	7	4	3	5.0
9	42	5	3	1	2.5
10	63	7	3	4	6.3
11	58	8	3	1	1.6
12	47	8	3	1	2.1
13	42	8	3	2	2.5
14	54	10	3	1	1.8
15	46	7	2	0	0 0
Girls					
6	51	8	2	8	15.7
7	46	4	3	7	15.2
8	33	7	2	1	3.0
9	49	8	5	3	6.3
10	66	11	2	3	4.6
11	49	8	2	4	8.9
12	49	12	4	0	0.0
13	63	9	2	3	4.7
14	47	9	1	0	0.0
15	51	10	5	3	6.0

be "skinnier" in shoes than without shoes. That is not true in every case because sometimes the child, when he takes off his shoes, falls below the next pound level but not below the next inch level. He, therefore, is computed as being of less weight but the same height, in which case, of course, he seems to be more underweight with his shoes off.

Table IV gives the maximum increase and the maximum decrease in the per cent of average weight for both boys and girls at various ages. The maximum increase for the older boys and girls runs as high as 12 per cent. That is, some children were changed 12 per cent in their relation to average weight when weighed without their shoes. This is partly because of the accident arising from using whole pounds and whole inches.

The average effect of removing shoes is shown in Table V for boys, for girls, and for the combined groups. It raises the average "percentage normal weight" about 2 per cent and decreases the size of the 10 per cent underweight group by one-fourth to one-half.

POPULATION CHANGES IN UNDERWEIGHT STATUS

In our Malden Studies a significant increase was found in the rate of growth for the group of children who improved their habits. We did not find a statistically significant change in the average "percentage of normal weight." In the latter computation the slight improvement was less than the probable error. Similarly we found no significant change in the number of children who were in the 10 per cent underweight group. We were, of course, very careful to avoid any change in the method of computing the per cent underweight. We

always used the Wood tables, age to the nearest birthday, and height taken at the same time as weight with shoes on.

A few children did come out of the underweight group and reach average weight. These were children who were thin because of poor health or poor nutrition and who made definite improvement in their health. Frequently, however, we noticed improvement in health as shown by color, alertness, and greater freedom from fatigue when there was no appreciable change in the body proportions. The most frequent changes in the number of children in the underweight group arose among those children who were near the 90 per cent figure and who were thrown into the underweight group or out of it by the crudity of the computations already discussed.

Different communities present widely divergent figures concerning the number of 10 per cent underweight children in their school population. Many school systems which started weighing and measuring with the children's shoes on now have the shoes removed, and a still greater number of schools have changed from the Wood tables to the Baldwin-Wood tables. Height is usually taken only two or three times a year and many schools follow the unscientific practice of using the height for the last measurement in computing underweight during the succeeding months when new weights are secured. In a few instances one age is used for the child throughout the year, and this results in the underaging and overaging process with the effect upon underweight data which has been pointed out.

The Malden Studies showed no significant change in the underweight figures when the same technic of measurement and computa-

TABLE V

AVERAGE PER CENT NORMAL

	Boys					*Girls*			
Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase	Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase
6	62	99.8	101.1	1.3	6	51	98.8	100.0	1.2
7	59	98.8	100.1	1.3	7	46	99.0	100.1	1.1
8	58	99.1	100.9	1.8	8	33	99.2	101.2	2.0
9	42	98.1	100.3	2.2	9	49	97.7	99.9	2.2
10	63	100.6	102.3	1.7	10	66	97.2	100.1	2.9
11	58	101.1	103.2	2.1	11	49	95.1	97.8	2.7
12	47	100.2	102.2	2.0	12	49	100.4	103.3	2.9
13	42	98.7	101.4	2.7	13	63	99.2	100.7	1.5
14	54	101.9	104.4	2.5	14	47	96.7	100.1	3.4
15	46	99.5	101.4	1.9	15	51	96.5	99.7	3.2

AVERAGE PER CENT NORMAL BOYS AND GIRLS

Age	No. in Group	With Shoes %	Without Shoes %	Av. % Increase
6	113	99.3	100.5	1.2
7	105	98.9	100.1	1.2
8	91	91.15	101.05	1.9
9	91	97.9	100.1	2.2
10	129	98.9	101.2	2.3
11	107	98.1	100.5	2.4
12	96	100.3	102.7	2.4
13	105	98.95	101.55	2.6
14	101	99.3	102.25	2.9
15	107	98.0	100.55	2.5

tion was carefully followed. How extensive would be the changes resulting from modifications in the methods of determining which children are in the underweight group? In order to answer this question we made 5 separate computations for the group of 10 per cent underweight children in the Malden Studies in February, 1922. Table VI shows the results of these measurements.

TABLE VI

PERCENTAGES OF CHILDREN IN THE 10 PER CENT UNDERWEIGHT GROUP WITH CHANGES IN THE METHOD OF COMPUTATION

March, 1922

239 Boys and 236 Girls

Method of Computation	Per Cent in Underweight Group		
	Boys	Girls	All
Wood Tables, March Age, March Height, With Shoes	20.9	29.6	25.3
Baldwin-Wood Tables, March Age, March Height, With Shoes	11.7	28.4	20.0
Baldwin-Wood Tables, October Age, March Height, With Shoes	10.9	26.7	18.7
Baldwin-Wood Tables, October Age, October Height, With Shoes	4.2	16.5	10.3
Baldwin-Wood Tables, October Age, October Height, Without Shoes	2.1	7.6	4.8

Using the technic which we followed throughout our experiment, 25.3 per cent of the 475 children under observation were in the 10 per cent underweight group. In changing to the Baldwin-Wood tables the size of the underweight group is reduced to 20 per cent. If we use October age, the figure is 18.7 per cent. If we use October height, it is 10.3 per cent. In taking off the shoes for the group (with changes indicated in Table V for the respective ages) the size of the underweight group was further reduced by 50 per cent. In brief, with one method of computation 25.3 per cent of the children were 10 per cent underweight. Making four changes in the method of computation only 4.8 per cent of the group were 10 per cent underweight.

SUMMARY

Height-weight-age tables show the *average* weight for children by height-age groups and do not show the ideal weight for any particular child.

There is a distinct difference in the standards set by the different standard weight tables.

The average variation from the mean for the supposedly healthy children used in the preparation of the Baldwin-Wood tables was approximately 6 per cent for 7-year old children, 8 per cent for 11-year old children, and 10 per cent for 15-year old children.

The computation of a child's "percentage of average weight" is inexact because of using weight to the nearest pound, height to the nearest inch, and age to the nearest year. In unusual cases a child may vary 7 per cent in relation to average weight because of the crudity of the computations and without any change in his bodily proportions. Fluctuations of 3 per cent or 4 per cent from this cause are not uncommon.

Wide fluctuations because of the crudity of individual computations are reflected in the average status of small groups and lost in the averages for large groups.

Inexactness, lack of reliability, and wide fluctuations in individual computations make the demonstration of minor changes in underweight status for a group of children uncertain, difficult and unreliable.

Children drop in and out of the underweight group without changing body proportions because of the inaccuracy of the computation. These facts supplement and further explain the previously published data from the Malden Studies' and provide a means of rationalizing these data with divergent data on underweight status from other sources.

The Baldwin-Wood tables show fewer underweights in a school population than did the Wood tables.

The increase in natural variability with advancing age produces an increasing number of 10 per cent underweight children in each higher grade when the health status is the same.

The removal of shoes in weighing and measuring may make an individual child more underweight or less underweight, but on the average it brings children from 2 per cent to 2½ per cent higher, and reduces the size of the 10 per cent underweight group by one-fourth to one-half.

Changes in the methods of collecting data or in the method of computation (such as removing shoes, changing tables, the method of taking height and the method of aging) constitute "balanced errors" which, singly or in combination, have a distinct and definite effect upon the underweight figures.

CONCLUSIONS

The schools should realize more clearly that standard weight tables give average weight, not normal weight, that there is a normal variation, and that some children must be below the average.

It is unscientific and unfair to set average weight as a goal for all children.

The 10 per cent underweight standard does not apply with the same significance to all age levels. The school should expect a greater number of 10 per cent underweight children in the later age groups due to the increased natural variability.

Since the natural variability of girls is greater than that of boys one must expect more underweight individuals among the former.

Seven per cent underweight is so close to the variation from the mean of average healthy children that it would seem to be unsuited for screening purposes. It may be that the 10 per cent underweight limit should be changed for older children.

The separation of 10 per cent underweight children is a rough screening. We should further divide this group by separating those children who are underweight because of slender build from those who are underweight because of emaciation, general ill-health or malnutrition. The public school should use its medical staff to make this separation. Further anthropometric tests should be developed and used as an aid in separating these two groups.

The school should not give up the regular weighing of children as an educational means of interesting them in health and in health practices. Emphasis should be placed upon gaining in weight each month and not upon the child's underweight status. The making of weight graphs and other classroom procedures should recognize this principle.

The failure to gain in weight over a period of several months is abnormal. Further studies should be made upon the consistency of gain in order to determine more accurately its value as an index of health. The practice in school administra-

tion which brings to the attention of teacher, nurse, or doctor the child who fails to gain in weight over a period of 3 months would seem to be commendatory.

Regular gain in weight month by month should assist in relieving anxiety concerning the health of an underweight child.

The percentage of 10 per cent underweight children in two communities cannot be compared unless the method of gathering data and the method of computation are known to be the same.

Communities weighing and measuring children without shoes will have only half or three-fourths as many 10 per cent underweight children as communities weighing and measuring with shoes.

A reduction in the size of the 10 per cent underweight group in a school population has no significance unless it is known that there have been no changes in the method of gathering and computing data.

Changes in the size of the 10 per cent underweight group do not constitute a reliable measure for the success of a school health program.

In the hands of the physician underweight is one of the valuable diagnostic factors. The separation of underweights in a school population for further medical attention may be a valuable screening process. That underweight in itself does not constitute a complete diagnosis is now becoming more widely recognized by the lay public. It would be extremely unfortunate if the data presented above were used to discredit either the scientific medical use of underweight or the practice of weighing children regularly in school as an educational procedure.

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Contagiousness of Leprosy

IN a group of 100 Louisiana lepers hospitalized more than 15 years ago, it has been disclosed from subsequent records that in 64 instances only one leper in the family developed the disease, while in the 36 other instances leprosy occurred in 83 additional relatives. There were 14 instances in which the disease occurred in a mother and one or more of her children; 15 instances in which the disease was found in sons of lepers; 21 instances in which the disease was found in daughters of lepers; 38 instances in which the disease was found among brothers and 31 instances in which the disease was found among sisters. In addition the following number of cases occurred in less closely related members of the family: 8 uncles, 8 aunts, 18 nephews, 9 nieces, 5 grandfathers, 3 grandmothers, 6 grandsons and 5 granddaughters. In some families the disease has invaded certain branches to the point of extermination.

Instances of the occurrence of leprosy in families have also been noted in cases from other states than Louisiana. It has not invariably happened that the parent became infected before the child; indeed, the reverse frequently occurred. Intimate contact for many years was common where there was more than one case of leprosy in a family. In many instances several contacts with leprosy also existed. In 5 cases the incubation period is calculated as not less than 6 years.

Antirabic Immunization with Desiccated Vaccine

D. L. HARRIS, M. D., FELLOW A. P. H. A.

St. Louis, Mo.

DESICCATED rabies vaccine has been used since 1912 for the immunization of men and dogs. The results and data are now reported, to permit a critical comparison of the value of this with other methods employed by various investigators in this country and elsewhere.

Shackell and Harris[1] found that if rabies vaccine were frozen to — 10° C. and then dried in vacuo over sulphuric acid, about 2 per cent of the infectivity could be preserved for several months. Harris,[2] continuing this work, showed that the proportion of virus remaining alive after desiccation depends entirely upon the degree to which the material is frozen. Fixed virus, frozen with liquid air and then dried, retains 90 per cent of its infectivity. When frozen with CO_2 snow and dried in vacuo over sulphuric acid in a jar which is kept at a temperature of — 15° C., the resulting product retains more than 50 per cent of its original infectivity.

In the original method the brain and cord was mixed with CO_2 snow and ground in a mortar. This resulted in frequent bacterial contamination, to avoid which a jacket was welded around a steel mortar, leaving a space between the walls. The CO_2 is now passed into and through this enclosed space, and the mortar is chilled without direct contact of the brain with the snow. In all other respects the preparation is carried on as heretofore described in detail.

Repeated experiments showed that subdural injections of 0.004 mg. of this desiccated material would regularly infect rabbits with the usual incubation period. It was further established that the subsequent rate of loss of infectivity depends upon the temperature at which the product is stored. When kept at — 1° C. the material has been found to be infectious for at least 3 years. One lot, dried and sealed in vacuo October 19, 1920, produced typical symptoms in 2 rabbits inoculated on October 27, 1923.

In a series of experimental inoculations to determine the rate of loss of infectivity I found that those rabbits which were injected with a quantity too small to infect acquired an immunity against a subse-

quent injection of a lethal dose of fresh virus. Since publication,[2] these results have been repeatedly confirmed, and the fact has been established that rabbits injected subdurally with non-infectious desiccated vaccine can later withstand a subdural inoculation of several hundred lethal doses of fresh virus.

In other words, the virus which after long preservation in vacuo becomes non-infectious, still possesses immunizing value. This, however, slowly diminishes and after a time disappears completely. The lot described above which was proved to be infectious 3 years after its preparation was found to have lost all its immunizing property 5 years later (1928).

In 1917, owing to a frequent bacterial contamination of the brain which was thought to be due to the trephine wound, I began to inoculate rabbits by inserting the needle through the optic foramen. Whether due to this procedure, or to the long preservation of the virus in the cold, or to some unknown factor, it was found in 1918 that many rabbits failed to develop the disease when inoculated with virus which had been kept in vacuo for longer than 3 months. This resistance to desiccation gradually lessened, so that in 1920 all infectivity of the vaccine disappeared after storage in vacuo for 2 months, without, however, any impairment of its immunizing properties, as shown by repeated tests on rabbits.

This rapid loss of infectivity necessitated a complete change in the original method of immunization, which consisted in the injection of increasing quantities of vaccine somewhat similar to the method of Högyes.

Having in mind Pasteur's theory that the injection of non-infectious cord protects against the subsequent injection of virulent cord, and that this in turn produces a degree of immunity sufficiently high to protect against the danger due to the bite of a rabid animal, I changed my scheme of treatment, giving 5 daily doses, 25 mg. each, of non-infectious vaccine of the old strain (A), and followed these, in ordinary cases, with 5 similar injections of a new and resistant strain (B) partly attenuated by preservation in vacuo for 3 months. This fresh strain secured from William H. Park, M.D., of New York, N. Y., was tested and found, as already noted, to remain infectious in vacuo for at least 3 years.

During the past 8 years, immunization has been based on this plan, and experience has shown it to be adequate for superficial bites. This last strain (B) has as yet shown no altered resistance as the result of repeated desiccation.

In the treatment of persons severely bitten on the hand the usual

course consists of 5 injections of the old strain (A), and 8 to 10 injections, of 25 to 35 mg. each, of the new (B), depending upon the extent of the bite and the number of days elapsed before treatment is begun.

After bites on the head and face, particularly when extensive or lacerating, 2 injections are given daily for 10 days, and the total amount administered is from 2 to 3 times that of the usual quantity.

Two examples will illustrate the present scheme of intensive treatment.

Case I—A farmer, age 28, was deeply bitten on the left hand and wrist by his own dog, October 6, 1926. The dog also bit 2 cows, and disappeared. These cows developed typical symptoms of rabies 2 months later and died. On December 17 treatment of the farmer was begun and it was continued intensively for 10 days. As shown in Table I, within the first 24 hours he was given 120 mg. (A), and during the next 9 days, 570 mg. of the infectious vaccine (B) which had been dried only 2 months previously and had therefore lost but little of its infectivity.

Case II—A boy, age 5, was severely bitten on the face, January 31, 1922. There was one deep wound over the left eyebrow, one on the chin, and a more superficial wound on the nose. Examination of the dog's head in the City Board of Health Laboratory had failed to show the presence of Negri bodies, but a guinea pig inoculated at the time developed symptoms 11 days later. Negri bodies were numerous in the brain. The boy was first brought in and treatment begun on the 13th day after the bite, 350 mg. of (A) being given during the first 72 hours. During the next 7 days, he received 350 mg. of (B) (see Table II).

TABLE I

TREATMENT IN CASE NUMBER I

Date	Mg.
Dec. 17/26 P.M.	60 A
Dec. 18/26 A.M.	60 A
P.M.	60 A
Dec. 19/26 A.M.	30 B
P.M.	30 B
Dec. 20/26 A.M.	30 B
P.M.	30 B
Dec. 21/26 A.M.	30 B
P.M.	30 B
Dec. 22/26 A.M.	30 B
P.M.	30 B
Dec. 23/26 A.M.	30 B
P.M.	30 B
Dec. 24/26 A.M.	30 B
P.M.	30 B
Dec. 25/26 A.M.	30 B
P.M.	30 B
Dec. 26/26 A.M.	30 B
P.M.	30 B
Dec. 27/26 A.M.	30 B

TABLE II

TREATMENT IN CASE NUMBER II

Date	Mg.
Feb. 12/22 P.M.	50 A
Feb. 13/22 A.M.	50 A
P.M.	50 A
Feb. 14/22 A.M.	50 A
P.M.	50 A
Feb. 15/22 A.M.	50 A
P.M.	50 A
Feb. 16/22 A.M.	25 B
P.M.	25 B
Feb. 17/22 A.M.	25 B
P.M.	25 B
Feb. 18/22 A.M.	25 B
P.M.	25 B
Feb. 19/22 A.M.	25 B
P.M.	25 B
Feb. 20/22 A.M.	25 B
P.M.	25 B
Feb. 21/22 A.M.	25 B
P.M.	25 B

During the past 17 years this vaccine has been given to 3,516 persons. In Table III will be found data on 2,032 of those treated.

Most of the treatments were sent by mail to the local physician with an enclosed questionnaire, but because in a large number of cases the physician either did not answer the questions as requested, or answered incompletely, the data in 1,484 cases are either entirely lacking or are too meager to justify their inclusion in this report.

TABLE III

DATA OF 2,032 CASES TREATED FOR RABIES

	Head	Hands and Forearm	Body and Lower Extremities	Contact	Total
Rabid	147	617	355	334	1,453
Probably Rabid	30	174	104		308
Unknown	19	100	87		206
Probably not Rabid	8	40	17		65
Total	214	931	563	334	2,032

Of all those treated, there has been only one failure. This was a farmer who, following a severely lacerating bite on his hand, July 1, 1913, began the treatment 5 days later. An intensive treatment was given for 7 days, but the patient insisted upon returning home for harvesting work. After a week of hard labor in the field during excessively hot weather, symptoms of rabies developed on the 20th day after the bite, the 14th day after the first injection.

I believe an important factor in our success is the intensive treatment given to all severely bitten patients.

One case of temporary post-vaccinal paralysis, occurring after a 10-dose treatment, has just been reported to me, but as yet I have not been able to obtain all the details.

No intensively treated patient has shown any paralysis. In my own personally treated cases reactions have been limited to local redness and swelling which disappeared promptly.

PROPHYLACTIC IMMUNIZATION OF DOGS

The prophylactic immunization of dogs presents an entirely different problem from that of men. The latter is one of necessity, while the former is a voluntary act for the prevention of a rare disease which is unlikely to occur. There are 2 prime requisites for a vaccine used as a prophylactic in dogs: first, its use must never result in the production of the disease itself; second, the immunity must be adequate to protect the animal, should it be exposed. The preparation must also be stable to permit distribution to veterinarians.

We believe that all of these requisites are found in our product. In its use in experimental work and in practical immunization of dogs,

not one of the animals has been infected by the vaccine and, so far as can be learned, no immunized dog has later developed rabies.

In all the earlier work the scheme for immunizing dogs followed that used in men. Beginning in 1915, dogs were given 6 injections of attenuated vaccine containing 125 mg. of the virus. Since 1920, when the method of dosage in men was altered, 300 dogs have been immunized with 3 injections of 30 mg. each of non-infectious vaccine (A), followed by 3 equal doses of the new (B) strain of attenuated virus.

It was evident, however, that 6 separate injections would be impractical and prevent its general use. Experiments were therefore undertaken to give the entire quantity in 2 doses—90 mg. of (A) followed 8 or 10 days later with 90 mg. of attenuated virus (B). These tests made on dogs, rabbits and rats have proved uniformly successful and entirely free from danger.

In one experiment 10 white rats were injected subcutaneously with 75 mg. of vaccine (A) and 5 days later were injected with 100 mg. of (B) which had been stored for 1 year in vacuo. At the same time 6 white rats were injected with 200 mg. of the same lot of (B). Twenty days later these 16 rats, together with 8 controls, were injected in the muscles of the neck with 1 c.c. of a thick emulsion made from the fresh brain of a dog that had died of rabies.

Four of the controls died of rabies. Negri bodies were found in their brains. None of the immunized rats developed rabies.

In a second experiment, 45 young white rats were injected subcutaneously with 200 mg. each of vaccine (B) which had been kept in vacuo for 8 months. Not one of these showed any symptoms of rabies during an observation of 3 months.

In a third experiment 28 young white rats were injected subcutaneously with 100 mg. each of virus (B) which had been kept in vacuo 27 days. Twelve days later 1 rat died, but no Negri bodies could be demonstrated in the brain. The others remained well for 3 months, when all were killed.

It is evident from these experiments that even in relatively large doses the vaccine is not infectious to white rats when given subcutaneously. The possibility that 1 rat may have developed rabies after a primary injection of (B) which was not attenuated, and which had not been preceded by the injection of a dose of non-infectious vaccine, is sufficient to justify the rule that no dog should be injected without a preliminary dose of non-infectious vaccine and that the second injection should always be with material whose infectivity has been somewhat lessened by storage in vacuo of at least 3 months.

Fifty dogs have been immunized by giving the vaccine in 2 doses. Not one of these animals has shown any symptoms of rabies, or any ill effect from that treatment.

Schoening's[3] experiments, and the fact that during the past year I have seen 5 rabid dogs which had been injected within less than a year with a single dose of phenolated vaccine, lead me to the conclusion that the degree of immunity resulting from a single injection of a killed vaccine is not adequate to protect a dog against all strains of street virus, and that the feeling of security from its use is not justified. As it has been found in distemper that dogs cannot be adequately immunized unless given a killed vaccine and a subsequent injection of a living virus, so I believe it will likewise be found in rabies that an effective immunization of dogs cannot be obtained by the use of a single injection of a killed vaccine. This should be reinforced, as in distemper, with a second injection of an attenuated but living virus.

CONCLUSIONS

In a total of 3,516 antirabic vaccinations, the uniformly successful treatment of every patient bitten on the head or face, with only 1 failure following a bite on the hand, warrants the conclusion that antirabic immunization with desiccated vaccine is as effective as by any other method.

Prophylactic immunization of dogs, to be effective, should consist of an injection of a non-infectious vaccine, reinforced later with a second injection of an attenuated but living virus.

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School Psychologists in Switzerland

IN addition to the school medical service of Basel, which has been in existence for some years, the administrative authorities of that city recently appointed a physician as "school psychologist." The school psychologist will make psychological examinations of the pupils and prescribe treatment when necessary. Among his duties will be the determination of the causes of unsatisfactory school work and examination of children recommended by the teachers or physicians for special classes, such as classes for specially gifted children, or for backward children, or for those with certain physical or mental defects.

The school psychologist also will aid the vocational adviser by making the necessary psychological tests.—*Pro Juventute*, Zurich, Nov., 1928, p. 416.

Antirabic Vaccination by Means of Desiccated Virus

RIGNEY D'AUNOY, M. D.

Department of Pathology, Charity Hospital of Louisiana, New Orleans, La.

FOR 18 years these laboratories have administered antirabic prophylactic treatment with material prepared along the lines indicated by Harris. We desire to tabulate the cases treated during the past 14 years, and to add a few observations that have been made on various properties of desiccated virus. As some modifications have been made in the technic proposed by Harris, it may be of value to describe briefly the methods used in the production, storage and administration of rabic virus, for the greater part of the time covered by this report.

Full grown, healthy rabbits, averaging 2,200 gm., are inoculated intracerebrally with an emulsion of desiccated fixed virus, the amount used being usually 0.004 mg. of material in 1 mil of sterile physiological salt solution. Injection is made after trephining, the material being deposited by means of a 24-gage needle, directly into the lateral ventricles. After 6 or 7 days the animals develop typical symptoms, and when complete paresis has intervened they are killed by ether narcosis.

The cord and brain are removed under aseptic conditions, stripped of their membranes and placed in a sterile mortar. Carbon dioxide snow is then added with constant mixing and trituration until first solidification, and later rather fine division have taken place. The ground material is spread in a thin layer over a cold sterile porcelain perforated plate that fits within a 25-cm. pyrex glass Scheibler desiccator previously sterilized and kept for a few hours at a temperature of — 12° C. A layer of sulphuric acid or phosphoric anhydride 2 cm. deep covers the bottom of the desiccator, and acts as dehydrating agent. A vacuum of 2 mm. of mercury is quickly produced within the desiccator, and it is stored at a temperature of — 12° C. to — 18° C. If the material has been spread in a layer averaging about 5 mm. thick, no difficulty is experienced in accomplishing desiccation within 48 hours.

The material is then scraped off by means of a sterile spatula, collected in a sterile mortar, and pulverized. The finely powdered material is placed in pyrex glass tubes 125 mm. long by 10 mm. in diam-

eter. These tubes are quickly sealed by flame and stored in a dark place at a maximum temperature of — 10° C., the usual temperature averaging between — 12° C. and — 15° C.

Notwithstanding the care exercised in preparing the virus, it is conceivable that at times bacterial contamination may occur. It is possible, however improbable, that spores of such organisms as *Clostridium tetani* may be in the carbon dioxide snow. Although the injection of such spores in man would, certainly in the great majority of cases, be followed by no ill effects, we have assured ourselves against such happenings by cultural control of every batch of virus prepared. Aerobic and anaerobic cultures are made from material obtained from each animal used, and also from each tube of completed virus. It is believed that these precautions have not been taken in vain, as we have never even experienced localized infections after subcutaneous injections of virus so prepared and so controlled.

STANDARDIZATION OF DESICCATED VIRUS

It has appeared necessary to establish arbitrary standards in dealing with desiccated rabic virus. So little is known of the agent concerned that the problem is one of great difficulty. The established methods of standardizing on the basis of protection, or on the basis of neutralization of toxic substances are, of course, not applicable. Throughout his work Harris used as a standard a " unit " which represented the smallest amount of desiccated material necessary to infect a rabbit. We employ a similar standard, designating it the " minimal infective dose," and defining it as the least amount of desiccated material which within 5 days after preparation and when kept at temperatures of — 12° C. to — 15° C. will cause paresis in a 2,400 gm. rabbit within 7 days following intracerebral injection. It is not claimed that this standard is of any great degree of accuracy, as naturally a number of factors enter into the question of infection. However, it is believed to be an advantage to have some fixed unchanging basis on which to establish the degree of infectivity of any particular batch of virus. There is no difficulty in producing a virus with a " minimal infective dose " of between 0.002 and 0.004 mg. when desiccation has been accomplished within 48 hours. If it has taken longer, the number of " minimal infective doses " will be greatly reduced per unit of material.

Desiccated virus may be kept in the dark at temperatures of — 12° C. over long periods without demonstrable loss of infectivity. One lot so stored contained the same number of " minimal infective doses " per mg. as when prepared 6 years previously. At refrigerator

TABLE I

STATISTICAL SURVEY OF CASES

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Totals
Number applying for treatment	859	938	1,040	993	879	667	750	650	705	905	1,014	1,304	1,140	1,492	13,636
Number of cases treated	223	148	324	369	300	174	154	218	249	445	495	474	759	793	5,125
Patients treated after injury by animals showing positive rabies by:															
Microscopic test	89	58	153	149	124	89	59	98	99	280	321	123	263	465	2,370
Biologic test	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10
Attacking animals not located	34	90	171	210	176	85	85	106	101	104	167	178	235	260	2,002
Rabies developed after treatment	0	0	0	0	1	0	1	0	0	0	0	0	0	3	5
Treatment paralysis	0	0	0	0	0	0	0	1	0	0	0	0	1	1	3

TABLE II

DISTRIBUTION OF LESIONS IN PATIENTS TREATED, INJURED BY ANIMALS PROVED TO BE RABID

	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	Totals
Head and face	10	4	11	9	16	10	5	6	5	15	20	16	14	29	170
Upper extremities	30	20	85	84	47	34	20	27	42	101	107	35	101	175	911
Lower extremities	30	16	35	37	34	20	22	38	32	107	142	53	95	186	847
Trunk	5	4	7	6	10	4	2	6	7	14	0	4	12	25	100
Multiple, including head and face	0	3	1	3	1	0	0	1	0	3	0	1	5	2	19
Multiple, excluding head and face	14	11	14	20	16	21	10	20	13	40	52	14	33	48	306

TABLE III

DISRIBUTION BY AGE OF TREATED CASES

Years	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
under 1	0	0	1	1	1	0	0	2	1	6	1	0	6	2
1– 3	19	17	29	21	27	19	13	15	20	31	37	30	40	35
3– 5	16	9	32	29	25	17	12	18	36	45	50	54	84	84
5–10	66	54	82	88	75	36	34	35	39	80	122	86	155	148
10–15	37	21	46	48	45	34	28	30	41	84	79	87	157	144
15–20	14	12	23	35	17	14	25	20	15	45	36	44	45	60
20–30	25	14	42	48	35	21	11	29	25	53	59	48	80	101
30–40	21	10	30	39	35	13	14	37	40	45	54	52	89	92
40–50	14	9	21	31	21	15	13	15	17	24	29	34	56	53
50–60	9	2	15	21	16	4	2	8	7	18	22	23	28	58
60–80	2	0	3	8	3	1	2	9	8	11	6	16	19	16

temperature (8° C. to 12° C.) infectivity may last approximately 3 years. At higher temperatures, infectivity is rapidly lost, never, in our experience, lasting longer than about 60 days at room temperatures (23° C. to 28° C.). We do not believe that there is any relation between infectivity and immunizing power.

METHODS OF ADMINISTRATION

Treatment has been carried out by administering subcutaneously an initial dose of 250 " minimal infective doses," doubling the quantity daily until a maximum of 2,000 was reached. We never consider the ratio existing between infective and non-infective material in the virus used. As a rule, the virus is 2 or 3 months old before use, but as it loses practically none of its infective power during that time, we are always dealing with a freshly prepared virus as far as infectivity is concerned. Usually a total of 11 treatments of 17,750 minimal infective doses are given, except in severe penetrating injuries of the face and scalp, when 15 treatments, or a total of 25,750 minimal infective doses, are given. In children under 3 years of age one-half the amount is administered.

During the last 14 years 5,125 patients have been treated with virus, generally prepared as outlined. Tables I and II show the treated cases and sites of injury by proven rabid animals. Table III classifies the treated cases according to age.

DIAGNOSIS OF RABIES

In this series, positive diagnosis of rabies was made only on finding Negri bodies (microscopic test), or on production of clinical rabies after intracerebral inoculation of test animals (biologic test). This latter we have discarded. With infected, decomposed brains it is useless, as invariably the test animals succumb to purulent meningitis when injected with such material. With satisfactory material it is too time consuming. Examination of brain sections, preferably cerebellar, prepared by a rapid fixation paraffin embedding method, and stained by Mallory's aniline blue, has been found the diagnostic method of choice.

POST-VACCINAL COMPLICATIONS

About 25 per cent (24.5 per cent for 1920 to 1923 inclusive) of the treated patients developed malaise and slight elevations of temperature. Approximately 10 per cent (9.8 per cent for the years 1920 to 1923 inclusive) developed a generalized urticarial-like eruption or localized erythematous wheal-like lesions at the sites of injections, probably due to sensitization by foreign protein. The gener-

alized rash proved extremely disagreeable and was accompanied by high temperature (102°–105°) in 0.2 per cent of the cases treated. Its usual time of appearance was between the 3d and 10th days of treatment, in some cases persisting as long as 5 days, the average duration being 36 hours. Its occurrence never prevented continuance of treatment.

Three cases of so-called "treatment paralysis" have occurred since our last report. One, in 1922, consisted of a transient weakness of the lower extremities in an adult white male, coming on the first day after completion of an 11-day treatment. It lasted 15 days and was treated by massage, hot baths, and bitter stomachics. Another case developed in a white male, 35 years of age, involving the facial muscles and the upper right extremities on the 8th day of treatment. Its duration was 10 weeks. Antirabic treatment was discontinued, and not again renewed.

Another case, in 1928 in an adult male, 49 years of age, terminated fatally, the immediate cause of death being ascending infection of the urinary tract after paresis of the lower extremities. Symptoms appeared after 5 injections. The offending animal did not have rabies. In addition to these authentic cases, it is possible that other slight and transient neuro-motor disturbances occurred, their nonrecognition being readily understood considering the type of patients treated by us.

We have had 5 deaths (non-protection) following complete treatment. The details of one (1919 series) is given in a previous report.[1]

The fatality in the 1921 series occurred in a negro, male (L. J.) 56 years of age, 44 days after completion of treatment, following slight injury to the hand by a rabid dog. In the 1928 series the first case of non-protection occurred in a negro child (D. L.) 10 years of age, symptoms developing 2 months after completion of treatment. The second, a man 44 years of age (E. S.), developed 2 days after completion of treatment. The third case occurred in a boy 14 years of age (T. G.), symptoms coming on 7 weeks after completion of treatment for bite on the hand by a rabid dog.

SUMMARY

There are reported 5,125 prophylactic antirabic vaccinations by a modified Harris method covering a period of 14 years. Of these, 2,380 followed injuries by proven rabid animals. Three cases of treatment paralysis, one terminating fatally, and 5 cases of non-protection after complete treatment occurred in the series.

REFERENCE

1. D'Aunoy, R. *J. Infect. Dis.*, 29: 261, 1921.

Iodized Salt

WILLIAM C. GEAGLEY

State Analyst, Chemical Laboratories, Department of Agriculture, State of Michigan, Lansing, Mich.

SINCE the prevalence of simple goiter in Michigan and its relation to iodine deficiency was outlined in a preliminary report by the Michigan Department of Health,[1] increasing importance has been attached to a universal medium for correcting this iodine deficiency. Of all the means suggested the most effective and generally accepted appears to be iodized salt, for obvious reasons.

The Michigan salt manufacturers were, I believe, the first group to undertake supplying iodine in the form of iodized salt, giving this important element to the people of this and other states at no additional cost.

The general adoption of this procedure in coöperation with the medical profession led to a preliminary survey and examination of the many different brands of iodized salt appearing on the market, with chemical analyses to determine the iodine content. The findings showed a marked variation in iodine content which did not appear warranted, and lessened the effectiveness of iodized salt for the purpose intended.

A coöperative study of the manufacturing methods and conditions under which iodized salt was produced was undertaken for the purpose of determining whether this variation could be eliminated and a uniform product be produced. As a result, a number of outstanding features bearing directly on the problem were observed which, if taken into consideration, would be of material assistance in producing a uniform product.

Two iodine compounds, sodium and potassium iodide, are used generally in the manufacture of iodized salt in Michigan. Claims were made by some that sodium iodide possessed a distinct advantage over the potassium salt, because of a slight difference in physiological properties. However, there were points in favor of the use of one salt or the other for physical or manufacturing reasons. The majority of manufacturers were persuaded to use the sodium salt because of its apparent advantages. Many authorities maintain that in an iodized salt prepared by using potassium iodide the percentage of po-

tassium iodide to salt is so small that when the mixture goes into solution in the digestive system there is such a large excess of sodium over potassium that the effect of potassium is negligible. In other words, if the physiological action of sodium is desirable there is such an excess of it in the salt that it more than counteracts the slight trace of potassium present in potassium iodized salt. As sodium iodide takes up moisture more freely, decomposing, discoloring and freeing iodine in the process, it is not so well suited to the preparation of iodized salt as potassium iodide.

There have been a number of attempts made and, I believe, successfully, to use organic iodides in the preparation of iodized salt. In Switzerland a number of organic iodides have been used quite successfully, and they are less likely to undergo decomposition, thereby possessing some advantage over the inorganic products. The cost, however, is greater and would probably have some bearing on their use. In the last few years W. L. Chandler of the Department of Bacteriology, Michigan State College, has developed a form of organic iodine which is claimed to have advantages over the inorganic products. Whether the use of this form of iodine in iodized salt will be advantageous in so far as the goitrous condition in Michigan is concerned remains to be determined.

The net results of the joint survey pointed out the necessity for a standardized method for mixing iodine and a uniform control procedure.

RECOMMENDED METHOD OF MIXING

Pulverize potassium iodide. Weigh accurately—not measure—2 lb. 2½ oz. of the ground iodide to every 97 lb. 12½ oz. of calcium phosphate.* Mix in a batch mixer for at least 5 minutes. Next grind the mixture to pass a 100-mesh sieve, or finer, and mix again in the batch mixer for at least 20 minutes. The actual iodine content should be checked at this point by analysis.

Weigh accurately 1 pound of this stock mixture for every 99 lb. of dried salt and mix in a batch mixer for sufficient time to give a uniform product as determined by analysis. Each type of mixer will probably have a different time requirement. Ten minutes should give a uniform product with the average mixer.†

Due to the small quantity of iodine as compared to the large bulk of salt, the batch mixer is less liable to give decided variations in uniformity of product than is the continuous mixer. When dealing with a substance as potent as iodine, extreme care should be taken to avoid an overdose as well as to assure the consumer of the presence of iodine.

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* Because the specific gravity of calcium phosphate is more nearly the same as salt, it lends itself to a better mixture than do most other drying agents. It also has some value as a mineral dietary adjunct for stock.

† Some manufacturers are using an extra mixing at this point. As an added assurance of obtaining a uniform product, the iodide-phosphate mixture is first mixed with a portion of the salt and later the remainder of the salt is added.

CONTROL

Accurate control is very essential because the percentage of iodine recommended is based upon reliable statistics. It is therefore essential that iodized salt adhere closely to this figure. It is of prime importance that the original iodide and dryer mixture be carefully analyzed for uniformity of iodine content. A sufficient number of samples of the finished product should be taken from each batch, or every hour's run, and the actual iodine content determined.

DETERMINATION OF IODINE IN IODIZED SALT

There are several recognized methods for the determination of iodine in the presence of chlorides. Most of them are either not applicable or are too unwieldy to be feasible in the case of iodized salt. The following method was worked out by the writer and found to be both fast and accurate: *

METHOD

Reagents:

1. Syrupy phosphoric acid. U.S.P.
2. Carbon disulphide c.p. This must be water clear and if not should be redistilled.
3. Hydrogen peroxide. U.S.P. Preserve in a cool, dark place.
4. Standard iodide solution is made by dissolving 0.2214 gm. of potassium in a liter of distilled water. It is not necessary to use salt and dryer in connection with this standard solution. Five c.c. of this solution represent 5 gm. of iodized salt containing 0.0221 per cent potassium iodide.† Preserve in a cool, dark place or make up fresh.

Weigh out 5 gm. of the sample. Dissolve in 25 c.c. of water in a separatory funnel.

Prepare at the same time two standards using 4.5 c.c. and 5.5 c.c. of the standard iodide solution. From this point, proceed with both the sample and standards as follows:

Add 5 c.c. of phosphoric acid. Pipette exactly 10 c.c. of carbon disulphide into the mixtures. Add 20 c.c. of hydrogen peroxide and rotate each for 5 minutes. Draw off portions of the lower disulphide layer through a pledget of absorbent cotton into test tubes of equal diameter, ⅜ or ½ inch preferably. Stopper tubes securely and compare the color of the sample with that of the two controls.

These controls represent a 10 per cent variation of iodine content. The sample should fall within the range of the two. If it does not, further mixing or adjusting of the batch will be necessary. A number of samples can be run at the same time, using the same two controls.

After iodized salt had been manufactured and marketed for a considerable time the director of the Bureau of Foods and Standards of the Michigan Department of Agriculture caused a number of representative samples of the different brands as offered for sale in the regular trade channels to be collected and submitted to the laboratories for determination of the iodine content (see Table I).

* This method may be used as an accurate, quantitative laboratory procedure by the use of a Duboscq type of colorimeter, in which case one control made with 5 c.c. of the standard iodide solution is used as the standard of comparison.

† This is recommended by the Michigan Department of Health and represents the iodine equivalent of 0.02 per cent of sodium iodide calculated to potassium iodide.

TABLE I

Sample No.	Iodine Claimed Per Cent	Iodine Found Per Cent	+ Excess − Deficiency Per Cent	PRINCIPAL LABEL
71320 A-59	.02	.002	−.018	Iodized Salt Calcium Phosphate 1.00% Potassium Iodide .02% Net Weight 2 lb.
71378 J-420	.02	.019	−.001	Iodine Table and Cooking Salt Contains about .02% of 1% Potassium Iodide Net Weight 2 lb.
71384 V-641	.02	.02	———	Prepared Iodine Table and Cooking Salt Added Ingredients, Sodium Iodide .02% Carbonate of Magnesium .98% Net Weight 2 lb.
71495 Y-81	.02	.007	−.013	Iodized Salt Contains .02% Sodium Iodide Net Weight 2 lb.
71526 II-1	.02	.005	−.015	Special Prepared Free Running Salt with Iodine 1.0% Calcium Phosphate .02% Sodium Iodide Net Weight 2 lb.
71316 A-58	.02	.014	−.006	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71373 V-643	.02	.017	−.003	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71380 J-422	.02	.0026	−.0174	Crystal Salt with Iodine Contains .02% of Potassium Iodide and about 1% Calcium Phosphate 32 oz. Net Weight
71310 A-55	.02	.019	−.001	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71372 V-642	.02	.01	−.01	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71377 J-419	.02	.0153	−.0047	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.

TABLE I (*Cont.*)

Sample No.	Iodine Claimed Per Cent	Iodine Found Per Cent	+ Excess − Deficiency Per Cent	PRINCIPAL LABEL
71424				
Y–79	.02	.0152	−.0048	Free Running Table Salt Contains .02% Sodium Iodide 1.0% Calcium Phosphate Net Weight 2 lb.
71345				
A–60	.02	.018	−.002	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71376				
J–418	.02	.018	−.002	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71431				
V–652	.02	.021	+.001	Iodine Salt Added Ingredients, Sodium Iodide .02% Calcium Phosphate .98% 1.00% Net Weight 2 lb.
71311				
A–56	.023	.018	−.005	Iodized Salt Potassium Iodide .023% Calcium Phosphate 1.00% Net Weight 2 lb.
71356				
Y–78	.02	.0133	−.0067	Iodized Salt Never Cakes or Hardens Potassium Iodide .02% Net Weight 2 lb.
71379				
J–421	.023	.016	−.007	Iodized Salt Potassium Iodide .023% Calcium Phosphate 1.00% Net Weight 2 lb.
71463				
V–660	.02	.0184	−.0016	Iodized Salt Never Cakes or Hardens Potassium Iodide .02% Net Weight 2 lb.

It will be noted that there is a deficiency in every instance except one.

The question naturally arises as to whether the deficiencies are due to a loss of iodine after manufacturing or to poor mixing. It has been

demonstrated a number of times that with carefully controlled manufacturing processes iodine may be incorporated in a fairly uniform manner throughout the mix. There are undoubtedly losses due to exposure and other conditions to which the manufactured product is subjected.

The laboratories have examined for iodine content many specimens of iodized stock salt in which the department has been interested because of its use and value for alleviating conditions found in newborn colts, calves, pigs, lambs, etc. After storing specimens under a number of different conditions it was readily demonstrated that many factors were influential in liberating iodine from salt.

This question was studied quite thoroughly under controlled conditions by Arnold H. Johnson and V. L. Harrington of the Chemistry Department of the Montana Agricultural Experiment Station. Their findings are quoted:

Iodized salts stored in atmospheres of relative humidities of 50 per cent lose smaller quantities of their iodine than salts stored under similar conditions at other humidities.

Iodized salts rendered alkaline by the addition of $NaHCO_3$ lose practically none of their iodine during storage, while neutral salts or salts rendered acid lose appreciable quantities.

Salts iodized with KIO_3 lose none of their iodine when stored for extended periods.

Exposure of iodized salts to sunlight effects a loss of iodine from neutral or acid salts; only a slight loss from salt rendered alkaline; and practically no loss from salts iodized with KIO_3.

Exposure to heat alone effects losses of iodine from acid, neutral, and alkaline iodized salts, and from salt iodized with KIO_3, in precisely the same order as did exposure to sunlight.

Exposure to light and heat simultaneously effects greater losses of iodine from salts of neutral or acid reaction than exposure to light alone or heat alone. In the case of iodized salts of alkaline reaction the losses of iodine are again insignificant or negligible, even though the salts are exposed to light and heat simultaneously.

The quantity of iodine liberated from a neutral salt iodized with KI appears to depend on the quantity of KI present.

REFERENCE

1. *Reprint Series No. 21,* Michigan Department of Health.

Typhoid Fever in a Rural Village of Porto Rico Due to a Surface Well

E. GARRIDO MORALES, M. D., DR. P. H.

Epidemiologist, Insular Department of Health, San Juan, P. R.

IN a previous report[1] the writer discussed the typhoid fever problem in Porto Rico in general, pointing out some of the outstanding epidemiological features of the disease as observed in the island. The present paper is a discussion of an intensive study made of an outbreak which developed in Judea, a village located in the municipality of Utuado, following the recent hurricane.

The investigation of the outbreak included:

An epidemiological study of all the typhoid fever cases reported or located in the village

A special survey of the entire population of the village to obtain some knowledge of its composition, as well as the sources of water and food supplies and the sanitary status of the people

A special investigation to determine the sources of infection of the outbreak, including a bacteriological examination of water from a well suspected to have originated the outbreak

The municipality of Utuado, one of the 77 into which the island of Porto Rico is divided, is located in the central and western part. It has a town with 4,093 inhabitants, the remainder of the population totalling 34,523 persons, distributed in 23 rural districts.

Arenas, one of the rural districts, with an estimated population of 2,075 persons in 1928, has a village where slightly over 600 people live. Because of the proximity of this village to the town of Utuado, the water supply of the latter was extended to it. Previous to the recent hurricane, the people had 3 main sources of water: a spring located at the bottom of a hill; a surface well situated close to a creek which crosses the village; and the public water supply from the town of Utuado. Since the aqueduct was damaged by the cyclone, water from this source was not available during 2 weeks following it. Although the town has a sewerage system, there are no sewer connections in the village. The disposal of excreta is in latrines, some of very poor construction.

No accurate records of the occurrence of typhoid fever in the village in previous years were available, but from the information col-

TABLE I

DATES OF ONSET

Week Ending	Number of Cases with Onset	Number of Patients Taken to Bed
Sept. 29	4	2
Oct. 6	5	5
Oct. 13	6	3
Oct. 20	7	7
Oct. 27	10	10
Nov. 3	6	8
Nov. 10	3	5
Nov. 17	–	1
Nov. 24	1	1
Total	42	42

lected in a house to house canvass, it appears that these people have been comparatively free from the disease in recent years. A history of a probable attack of typhoid fever, during the last 5 years, was obtained from only 6 persons in the village. Two of these died and none was confirmed by bacteriological examination. Forty-six cases were reported from the village during the present outbreak, 4 of which were eliminated because they were not typhoid fever. All others were confirmed bacteriologically and 4 terminated in death.

The dates of the onset of first symptoms and the dates on which the patients were confined to bed were as shown in Table I.

The chronology of the outbreak suggests massive infection with its maximum intensity in the latter part of September.

The cyclone occurred on the 13th of the same month, and on this date that group of people in the village who had used water from the public water supply of Utuado, because of the damage to the aqueduct,

TABLE II

AGE AND SEX OF THE CASES

	Males		Females		Both Sexes	
Age Groups	No.	Per Cent	No.	Per Cent	No.	Per Cent
0– 4	2	10.53	1	4.35	3	7.14
5– 9	5	26.31	2	8.69	7	16.67
10–14	4	21.05	2	8.69	6	14.29
15–19	1	5.26	7	30.43	8	19.05
20–24	1	5.26	4	17.39	5	11.90
25–29	2	10.53	1	4.35	3	7.14
30–34	–	——	2	8.69	2	4.76
35–39	2	10.53	1	4.35	3	7.14
40–44	2	10.53	1	4.35	3	7.14
45–49	–	——	–	——	–	——
50–54	–	——	–	——	–	——
55–59	–	——	1	4.35	1	2.38
60 over	–	——	1	4.35	1	2.38
Total	19	100.00	23	99.99	42	99.99

began using water from a surface well located nearby. Table II gives age and sex of cases investigated.

Males under 20 apparently furnished a disproportionately large percentage of the cases, though the numbers are too small to be significant.

The age groupings and sex of the cases and those living in the village who were not attacked are presented in Table III.

TABLE III

AGE AND SEX OF RESIDENTS AND CASES

Age Groups	Males				Females				Both Sexes			
	Persons		Cases		Persons		Cases		Persons		Cases	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Under 20	150	52.26	12	63.16	200	57.47	12	52.17	350	55.12	24	57.14
Over 20	137	47.74	7	36.84	148	42.53	11	47.83	285	44.88	18	42.86
Total.....	287	100.00	19	100.00	348	100.00	23	100.00	635	100.00	42	100.00

The number of persons of both sexes under 20 in the village exceeded those over 20 years of age. The lengths of residence of the patients and controls were as given in Table IV.

TABLE IV

LENGTH OF RESIDENCE OF CASES AND CONTROLS

Length of Residence	Cases		Controls	
	No.	Per Cent	No.	Per Cent
1 year or less.....	12	28.57	181	28.50
2 years.....	12	28.57	135	21.26
3 years.....	9	21.43	181	28.50
4 years.....	8	19.05	92	14.49
5 or more years.....	1	2.38	46	7.24
Total.....	42	100.00	635	99.99

Although 28 per cent of the cases occurred among persons who had resided in the village less than 1 year, and over 95 per cent in those who had resided there less than 5 years, this was also true of those not attacked; so the disease was not excessively prevalent among newcomers.

Whether any of the patients or the control group had been absent from home during 30 days previous to the outbreak was determined, with the results shown in Table V.

TABLE V

ABSENCE FROM VILLAGE

Statement Regarding Travel	Cases		Controls	
	No.	Per Cent	No.	Per Cent
Yes.....	2	4.76	58	9.13
No.....	40	95.24	577	90.87
Total.....	42	100.00	635	100.00

The sanitary condition of the premises and the economic status of the patients and controls were as presented in Table VI.

TABLE VI

SANITARY AND ECONOMIC STATUS

	Economic				Sanitary			
	Cases		Controls		Cases		Controls	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Good	1	2.38	29	4.57	2	4.76	43	6.77
Fair	2	4.76	63	9.92	15	35.71	196	30.87
Poor	25	59.52	334	52.60	17	40.48	268	42.20
Very poor	14	33.33	209	32.91	8	19.05	128	20.16
Total	42	99.99	635	100.00	42	100.00	635	100.00

As one would expect to find in any rural district of Porto Rico, the economic and sanitary status of the people was rather low. The epidemic, however, was not confined to those of any economic or sanitary status, the cases being distributed in proportion to the number of persons in each group.

Whether or not the persons or patients had eaten ice cream or had meals away from home during 30 days previous to the onset of the outbreak was determined, with the results shown in Table VII.

TABLE VII

INVESTIGATION REGARDING FOOD EATEN

	Ate Ice Cream				Had Meals Away from Home			
	Cases		Controls		Cases		Controls	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Yes	17	40.48	218	34.33	1	2.38	44	6.93
No	25	59.52	417	65.67	41	97.62	591	93.07
Total	42	100.00	635	100.00	42	100.00	635	100.00

The dealers supplying milk, with the corresponding incidence rate per 1,000 for each, are shown in Table VIII.

TABLE VIII

INCIDENCE RATE BY DEALER SUPPLYING MILK

Dealers	Cases	Persons	Attack Rate per 1,000
J. G.	9	78	115.38
C. N.	2	31	64.52
A. M.	4	46	86.95
L. G.	11	141	78.01
C. Bros.	5	41	121.95
Condensed milk	1	16	62.50
Own cow	3	47	63.83
Other sources	4	102	39.22
Unknown	3	103	29.13
None	—	30	
All sources	42	635	66.14

The cases were distributed in fair proportion among 5 main dealers. All the patients investigated boiled their milk before using, a habit

common among the people living in tropical countries. Table IX states the method of disposal of excreta.

TABLE IX

EXCRETA DISPOSAL

Method of Disposal	Cases		Controls	
	No.	Per Cent	No.	Per Cent
Latrine in the house	2	4.76	48	7.56
Latrine outside	35	83.33	485	76.38
No latrine	5	11.90	102	16.06
Total	42	99.99	635	100.00

Table X gives the dates of onset of first symptoms of all cases in households in which 2 or more cases occurred.

TABLE X

DATE OF ONSET

Family	First Case		Second Case		Third Case		Fourth Case	
	Case No.	Date of Onset	Case No.	Date of Onset	Case No.	Date of Onset	Case No.	Date of Onset
A	1	Sept. 23	5	Oct. 1	28	Oct. 23	34	Oct. 26
B	4	Sept. 28	17	Oct. 14	18	Oct. 15		
C	8	Oct. 4	9	Oct. 4				
D	10	Oct. 9	23	Oct. 20				
E	11	Oct. 10	42	Oct. 10				
F	12	Oct. 11	25	Oct. 21	40	Nov. 1		
G	14	Oct. 13	31	Oct. 25				
H	22	Oct. 19	24	Oct. 21				
I	32	Oct. 25	41	Nov. 4				

In families C, E, and H, contact infection was impossible. In families D, F, G, and I, infection through contact was possible but not probable, as the time between primary and secondary cases was presumably too short. The dates of onset of primary and secondary cases in those instances where infection could have been contracted through visiting were as presented in Table XI.

TABLE XI

INTERVALS BETWEEN PRIMARY AND SECONDARY CASES

Primary Case		Secondary Case		Interval in Days between Primary and Secondary Cases
Case No.	Onset	Case No.	Onset	
8	Oct. 4	39	Oct. 31	27
9	Oct. 4	20	Oct. 15	11
24	Oct. 21	37	Oct. 29	8
14	Oct. 13	30	Oct. 24	11
19	Oct. 15	29	Oct. 23	8
9	Oct. 4	13	Oct. 14	8
32	Oct. 25	33	Oct. 26	1

In case number 33 contact infection can definitely be excluded. In the rest, except case 39, the incubation period was perhaps too short for contact infection, unless a heavy dose of germs was ingested. This might have happened through multiplication of typhoid bacilli in a

contaminated food partaken by any of these patients. All, however, denied having eaten anything during their visits to other cases.

It has been definitely established that when typhoid fever is introduced into a community where the methods of excreta disposal are faulty and where the care and precautions at the bedside of patients are obviously defective, infection through contact always plays a part in the dissemination of the disease. In view of the above facts it is presumed that personal contact, both direct and indirect—in the present instance because of the unusual conditions prevailing in the village after the hurricane—although not the major factor was an agent of some importance in the spread of the outbreak.

The sources of water used by the patients and controls during 30 days previous to the outbreak are given in Table XII.

TABLE XII

ATTACK RATE BY SOURCES OF WATER SUPPLY

Source of Water	Persons in Village Using Each Source	Cases Using Each Source	Attack Rate per 1,000 among Each Group
Aqueduct and suspected well	226	28	123.89
Spring alone	139	1	7.19
Aqueduct and spring	46	2	43.48
Aqueduct, spring and suspected well	54	5	92.59
Spring and suspected well	30	5	166.67
Aqueduct, well, other sources	19	1	52.63
Spring, other sources	17	—	—
Aqueduct, other sources	49	—	—
Aqueduct, spring, other sources	22	—	—
Various sources	33	—	—
All sources	635	42	66.14
Well water	329	39	118.54
Not well water	306	3	0.98
Both	635	42	66.14

The risk of attack among those who used well water was 118.54 per 1,000, while the risk of attack among the group who did not was 0.98 per 1,000. Stating it in a different way, 329 people who used well water, or 51.81 per cent of the total population, contributed 39 cases or 92.86 per cent of the total number, while 306 people who did not use well water, or 48.19 per cent of the total, furnished only 3 cases, or 7.14 per cent of the total number recorded.

On the basis of probability, in a normal group, the expected number of cases among the people who did not use well water was 20, and only 3 occurred, while the expected number in the group who used it was 21, and 39 occurred. The probability that such a distribution was due to chance alone is 1 in 10,000. Two out of the 3 cases which occurred among those who did not use the well water gave a history of

direct intimate personal contact with a previous case and were regarded as probable contact patients.

CONTAMINATION OF THE WELL

The investigation conducted to locate the possible sources from which the well was contaminated revealed that on August 14 a young woman was taken ill with typhoid fever in the village. This patient had clinical typhoid, and her Widal on August 29 was positive. Her home was in close proximity to the well. The excreta from the patient was disposed of without the addition of any disinfectant, in a poorly constructed latrine about 6 yards from the well. The opportunities for its contamination with the privy contents were ample, especially after the heavy rains which accompanied the hurricane.

The bacteriological examination of a sample from the well, obtained on October 26, gave the following results:

Bacteria per c.c. innumerable
Fermentation in 10 c.c. (48 hours) 80 per cent
B. coli in 10 c.c. present
B. coli in 1 c.c. present
B. coli in 0.1 c.c. present

SUMMARY

The explosive character of an outbreak of typhoid fever following the recent hurricane among the people living in Judea, a semi-rural village of the municipality of Utuado, P. R., together with the high incidence rate among the population in the village, immediately suggested a vehicle in use by a large proportion of the people, as the chief factor of causation. Water from the public supply of Utuado was eliminated because the people in that town escaped. Only 4 cases occurred in that town with a population of over 4,000, 90 per cent of whom used the public water supply. The infection in 4 cases which occurred in a single family was traced to probable contact with a case in Judea, through a cook who nursed her sister, a typhoid patient in the village, and prepared all the food for this family in the town. Milk, ice cream, and other foods were excluded as contributing to the spread of the outbreak.

Water from a surface well used by about one half of the people in the village after the hurricane was regarded with suspicion. The result of the epidemiological investigation confirmed the suspicion and this water was regarded as the major factor in the causation of the outbreak. Although the people who used water from this well formed only 51 per cent of the total population of the village, this group contributed 92 per cent of the cases. Infection in 2 out of only 3 cases who did not use this water supply was definitely attributed to contact

with previous cases of the disease, leaving only 1 case in the group who did use well water whose origin was not determined.

The evidence seems to warrant the conclusion that water from the surface well was the major factor in the causation of typhoid fever during the recent outbreak in the village of Judea, and that contact infection acted as a secondary contributing factor.

REFERENCE

1. Morales, E. Garrido. *Porto Rico Review of Public Health and Tropical Medicine*, 4: 381, 1929.

Spanish Law on Maternity Insurance

COMPULSORY maternity insurance was established in Spain by a law passed March 22, 1929, the provisions of which differ considerably from those of the provisional decree on the same subject of August 21, 1923. The purpose of the law, like that of the decree, is to give effect to the international draft convention on the protection of maternity ratified by Spain in 1922.

According to the new law all wage earning women between the ages of 16 and 50, except those in domestic service, must carry maternity insurance. Each insured woman will pay 7.50 pesetas (about $1.50) annually, and her employer will pay an equal amount. The State is to contribute to the insurance fund 50 pesetas for each confinement and other unspecified amounts for nursing benefits.

Every insured woman is entitled to medical aid and medicines during pregnancy and confinement and to a weekly cash benefit for the 6 weeks following her confinement, during which she is required to stay away from work. Her place must be kept for her by the employer for a certain length of time. Upon presenting a physician's certificate of pregnancy, an insured woman has the right to stay away from work for the 6 weeks before her confinement, and a benefit is paid during that time also.

The amounts to be paid as benefits will be set in subsequent regulations.

The law also provides for the establishment of a Maternity and Infancy Fund (*Fondo Maternal e Infantil*) to be used for establishing new maternity and infancy health centers and for aiding those already in existence. The resources of the Fund will consist of a certain percentage of the premiums paid by the insured women and of donations from public and private sources.

When the available resources permit, a cash benefit may be paid beyond the prescribed period if the mother is ill as a result of childbirth, or if the mother loses her employment through such illness, or if the child is ill.

The general administration of the law will be in the hands of the National Provident Institute, which administers also the law on old-age pensions. To see that the women are given the medical aid, the cash benefit, and the rest period prescribed by law, local maternity insurance organizations will be established in certain cities. In other places local administration of the law will be carried on by certain approved mutual aid societies, public child welfare boards, public boards of education, or public health boards, in which the insurance organizations, the workers, and their employers must be represented.

The law prescribes fines for employers and employees who fail to comply with it.—*Gaceta de Madrid*, Mar. 24, 1929, pp. 2202–2206.

Nativity and Disease Susceptibility

GEORGE B. L. ARNER, PH. D.

Pennsylvania Bureau of Vital Statistics, Harrisburg, Pa.

MORTALITY rates from diseases of advanced life in the United States are uniformly higher among the foreign born than among the native born. Furthermore, the mortality rates from these causes are much higher among the Irish and German born than among those born in Italy, Poland and the former Austro-Hungarian empire. In view of these surface indications investigators have frequently assumed that the foreign nationals in the United States, and particularly the Irish and Germans, were particularly subject to whatever disease happened to be in question.

In making these statements such investigators have lost sight of the rather obvious fact that the foreign born are on the average older than the native born. The native born population is regularly distributed with regard to age with the largest number in the first age group and numbers diminishing steadily with advancing years. The foreign born population on the other hand is small in the age group under 5 years, since the children of the foreign born are themselves usually native born. In the population of Pennsylvania in 1920 the median age of the native born whites was 21.4 years, with quartiles at 9.3 and 39 0, while in the foreign born population the median age was 38.4 years, with quartiles at 29.4 and 49.8.

In 1927 there were, according to the state tabulation, 9,283 deaths in Pennsylvania from cancer and 20,771 from heart disease, giving crude death rates for these causes of 95.4 and 214.0 per 100,000 population. The median age at death from cancer was 62.2 years and from heart disease 66.3 years. The crude death rates by nativity for cancer were, native born 81.2 and foreign born 180.2, and for heart disease, native born 184.0 and foreign born 382.3 per 100,000 population. But by computing age specific death rates, multiplying these rates by the estimated native and foreign population at each age group and adding the products, it is found that on the basis of age alone the expected number of cancer deaths by nativity would be 7,096 native born and 2,187 foreign born. The actual figures were 6,843 native born, 2,343 foreign born and 97 unspecified. For heart disease the expected distribution of deaths was native 16,024 and

foreign 4,747 as compared with an actual distribution of 15,509 native, 4,970 foreign and 292 unspecified. In view of the difficulty of making satisfactory population estimates by age, 7 years after an enumeration, these results are remarkably close, and show that age for age there is little difference in the mortality from cancer and heart disease as between the native born and the foreign born.

Roughly estimating the numbers of foreign born in Pennsylvania by country of birth, the crude death rates for each of the principal national groups from cancer and heart disease were as shown in Table I.

TABLE I

Country of Birth	Rates per 100,000 Population in Each Nationality	
	Cancer	Heart Disease
United States	81	184
Ireland	428	1,127
Germany	480	1,120
Italy	105	195
Austria-Hungary	106	201
Poland	111	242
Russia	127	290
All Other	217	393

It will be noted that the death rates for the Irish and Germans are extremely high, while the natives of Italy, Austria-Hungary, Poland and Russia have rates little above those of the native born population. In the group of "all other countries" the largest numbers are from Great Britain, the Scandinavian countries and Greece.

The U. S. Census does not give the age distribution of the separate national groups of the foreign born population; so it is impossible to calculate directly the expected mortality of these groups on the basis of age. But it is well known that the waves of Irish and German immigration came early, while the Italian, Austro-Hungarian, Polish and Russian immigrations followed after the influx of the Irish and Germans began to decline. In the United States as a whole the populations of Irish and German birth were greater in 1890 than in any other census year. That was nearly 40 years ago, and the survivors of that early immigration must now be well advanced in age. On the other hand, in spite of the practical suspension of immigration during the World War, the populations of Italian, Austro-Hungarian, Polish and Russian birth were larger in 1920 than in any previous census year. It is certain therefore that the median ages of the living Irish and German born populations are far higher than the median ages of those born in the other countries named. The cancer and heart disease death rates of the Irish and German born correspond with the age specific death rates in the entire population for the group between

the ages of 60 and 69 years. Considering the time which has elapsed since the peak of the immigration from these countries it is entirely possible that the median age of the Irish and German born in Pennsylvania is somewhere between 60 and 70 years. The death rates from these causes among the other national groups mentioned correspond with the age specific death rates of the group between 40 and 49 years. Since the median age of the foreign born in Pennsylvania was 38.4 years in 1920, and since the foreign born in Pennsylvania were largely of this later immigration, and further since there has been very little immigration since 1920, it is very probable that the median age of the natives of these countries in Pennsylvania was between 40 and 49 years in 1927.

While the numbers of living persons by country of birth and age are not available, the deaths by nativity and age give some indication of the relative ages of the national groups in which the deaths occur. Table II gives for both cancer and heart disease the median age at death and first and third quartiles for all deaths from these causes in Pennsylvania in 1927 and for each of the indicated national groups.

The differences in age classification between the Irish and Germans and the other foreign born are very striking. In cancer, the median age at death of the German born is 13 years higher than for those born in Austria-Hungary, and in heart disease the difference is still greater. Since there are comparatively few deaths from either of these diseases under the age of 45, which is the lowest age on the table for a first quartile, the differences in age groupings between the

TABLE II

COMPARATIVE AGES AT DEATH FROM CANCER AND HEART DISEASE BY COUNTRY OF BIRTH
Pennsylvania, 1927

Country of Birth	Cancer			Heart Disease		
	1st Quartile	Median	3d Quartile	1st Quartile	Median	3d Quartile
	Years	Years	Years	Years	Years	Years
Total	51.8	62.2	71.1	53.5	66.3	75.7
United States	52.0	62.7	71.7	52.8	66.6	75.8
Foreign	51.6	61.1	69.3	55.1	65.4	75.4
Unspecified	48.4	58.0	68.0	52.6	64.6	74.1
Ireland	55.7	63.7	73.7	61.1	69.9	78.5
Germany	60.5	67.5	75.0	64.9	73.9	80.3
Italy	46.6	57.5	66.3	50.1	60.4	68.1
Austria-Hungary	46.9	54.6	62.5	47.2	56.3	65.1
Poland	45.7	52.7	60.3	45.7	54.2	62.3
Russia	48.9	57.2	62.6	50.3	59.5	67.4
Other Countries	53.7	62.6	70.7	58.9	69.0	77.0

native born and the total foreign born are not reflected in this table. The median ages at death from these diseases are even slightly lower for the foreign born than for the native born. The differences as between national groups are just what should be expected at the presumed relative age classifications of these groups.

While we should like to be able to confirm our conclusions by an accurate standardization of mortality rates as between the different groups of the foreign born, all of these figures point to the conclusion that there is no difference in rates from cancer and heart disease which cannot be accounted for by differences in the age composition of these national groups. These diseases, and perhaps all diseases of advanced life, appear to know no distinction between native and foreign, German or Italian, Irish or Hungarian. Any assertion of a greater or less susceptibility to disease in any group of the population needs to be supported by something more than crude rates.

The Woman Physician

NO group can so effectively, so humanly, meet the growing demand for health direction as the woman physician. I believe she is naturally better equipped to specialize in this line than the man of our profession. It has always been the woman who has cared for the health of her family; it was always the woman in the early communities, before the days of the doctor and nurse, who served her neighbors with natural, simple remedies, and it has been my observation that women have more interest in the constructive things of life than in the destructive. Perhaps the basis of this is biological. At any rate you and I have these desirable and necessary qualities of our sex in addition to our training as physicians to apply to furthering this new interest in health. The combination should make us lead out in this movement. Whether we become health specialists, or include the health practice with our present practice, there is still one more thing we may do, and that is, never let an opportunity pass of making clear the difference between the strictly medical, the protective and the preventive examinations on the one hand and the health examination on the other; and also by never letting a chance go by to stress the fact that a health examination automatically necessitates a health prescription leading to a specific goal of health positive. When we can get both the lay and the professional to come to a like understanding on these points, then health positive will have become a fact, a recognizable and accepted asset of human welfare. Lenna L. Meanes, M.D., "The Health Examination and its Goal"—An address read before the New York City Medical Woman's Association at the New York Academy of Medicine, *Med. Woman's J.*, 36, 7: 169 (July), 1929.

Two Milk-borne Septic Sore Throat Epidemics

PAUL B. BROOKS, M. D., FELLOW A. P. H. A.

Deputy State Health Commissioner, Albany, N. Y.

TWO milk-borne epidemics of septic sore throat developed in New York State between February 1 and April 1, 1929, under circumstances which in several respects were similar. Both were explosive in character and occurred in rural villages—in Wayland, Steuben County, with a population of 1,767, and Savannah, Wayne County, with a population of 612; each was traced to raw milk from a herd in which a case of mastitis was discovered; and there were cases of sore throat on both farms, in one instance previous to the discovery of the mastitis, and in the other subsequent to its discovery.

THE WAYLAND OUTBREAK

There were 141 known cases at Wayland, nearly all developing February 16 and 17, with the last on the 18th. All those investigated had used raw milk from the G. H. dairy, which sells approximately 128 quarts of raw milk daily to 120 families, out of a total for the village of approximately 700 quarts.

About February 1 there was a case of sore throat in the G. H. family, and on the 12th the principal milker developed the condition, apparently continuing to milk. There were no cases among patrons in the interval. On February 16 and 17, when most of the victims were having their onsets, Mr. and Mrs. G. H. developed the disease. On February 14 mastitis, involving one quarter, was discovered in a cow. As nearly as could be determined the milk from this cow was excluded until the 16th, was included on the 16th, 17th and morning of the 18th, and then permanently excluded. Table I gives the chronological relationship.

The epidemic first came to light on February 18 when the proprietor of a local chair factory reported that 40 employees were off duty on account of illness associated with sore throat. This factory obtained 80 pint bottles of milk from the G. H. farm daily, and investigation revealed that all of the employees who were ill had used the milk. In one family 3 persons who had used G. H. milk were ill, while 1 who used no milk, and a baby receiving only boiled milk,

TABLE I

WAYLAND

Feb. 1	2–11 inclusive	12	13	14	15	16	17	18
Case on G. H. farm		Onset of case of principal milker		Mastitis discovered		*Cases developed* among patrons; most of them on 16th and 17th		
				Milk from cow with mastitis excluded		*Milk included* 16th, 17th and morning of 18th		Definitely excluded on the 18th

escaped. In another family 2 children who received only boiled milk escaped, while 2 adults using G. H. milk raw were ill. In 2 cases it was determined with practical certainty that the milk responsible for the infection was consumed on the afternoon and evening of Saturday, February 16, and that the first symptoms of illness appeared early the following morning. Peritonsillar abscesses and adenitis complicated several cases, and death occurred in 1 case complicated by facial erysipelas.

The county laboratory on February 20 examined a milk sample from the infected quarter of the cow with mastitis. It was " thick and yellow and contained a great number of pus cells " and " short chain " streptococci. Tests were not made for hemolysis. Subsequently the state laboratory received " about 3 c.c. of slightly brownish thin milk " from the infected quarter, and, although there were many pus cells and bacteria, no hemolytic streptococci were found. The predominating organism was a streptococcus producing methemoglobin. At the same time throat cultures from a number of convalescent patients including the proprietor of the G. H. dairy were examined and found to contain hemolytic streptococci, believed to be of the type usually associated with human infections of this character.

THE SAVANNAH OUTBREAK

At Savannah there were approximately 75 cases, between March 10 and 18, most of them between the 10th and 13th, the " peak " occurring on the 12th, and the last cases, except 2 contact infections, developing on the 18th. All of those investigated had used raw milk from the W. H. dairy. The proprietor is the only dealer—aside from a few people selling surplus milk from one cow—and distributes between 100 and 200 quarts of raw milk daily. Three members of the W. H. household were ill, but not until March 12. No evidence could be obtained of the occurrence of sore throat on the farm previously.

One cow in the herd sustained an injury to one teat about March 2, which prevented the use of the milking machine, but the other three

quarters were milked by hand. A veterinarian examined the cow on the 6th and stated that at that time he found no evidence of mastitis. Swelling was said to have been discovered first on March 13, but milk from the unaffected three quarters appears to have been included until the 15th, when the dairy was visited by representatives of the State Department of Health, and the cow segregated. At that time the animal was obviously ill.

The epidemiological evidence connecting the W. H. milk with the epidemic was conclusive, as in Wayland. In one family a child who received the milk at school was ill, while no cases occurred among other members of the family who used other milk only. In another family 2 adults who used the W. H. milk on cereal were ill, while 2 children who had no milk escaped. Several cases were complicated by abscesses and adenitis, and there was 1 death directly or indirectly attributable to the epidemic.

TABLE II

SAVANNAH

Mar. 2	6	7–9	10–11	12	13	14	15	16–18
Cow's teat injured	Cow examined by veterinarian. No evidence of mastitis			*Case developed among patrons* Peak of epidemic onset of 3 cases on farm	Mastitis discovered			
	Milk from injured cow included				*Milk from* affected quarter said to have been excluded		*All milk* excluded	

Dr. Hervey reported the following interesting and significant instance of infection. The veterinarian, who lives in an adjoining village and had used no milk from the W. H. dairy, visited the dairy with representatives of the State Health Department on March 15. In the course of an examination of the cow with mastitis he drew material from the infected quarter, for visual examination, into the palm of one hand; then with this hand he drew milk from an apparently unaffected quarter into the other hand and tasted it "to see if it was salty." Two days later he developed a sore throat. Cultures submitted for laboratory examination were found to contain hemolytic streptococci.

Dr. Breed and members of the staff of the state laboratory isolated these organisms from milk from the affected quarter of the cow with mastitis. Throat cultures submitted to the state laboratory from a number of the patients were also found to contain hemolytic streptococci. This laboratory has reported that the organisms from the milk and from representative cases corresponded as to morphological and

cultural characteristics, and biochemical reactions, and apparently were of the type usually associated with human infections of this character.

RELATION OF MASTITIS TO THE EPIDEMICS

The most interesting question in connection with these outbreaks is the relationship, if any, between the cases of mastitis and the epidemics. At Wayland failure to find hemolytic streptococci in material from the infected udder leaves a " missing link " in the chain of evidence, since the material was not received and examined at the state laboratory until March 11, over 3 weeks after discovery of the mastitis. The possibility of these organisms having been present earlier must be considered. It will be recalled that the infected udder was discovered on the 14th, and the milk excluded until the 16th; it then apparently was included again until the 18th, when it was definitely excluded. All of the cases developed between the 16th and the 18th. If the mastitis was responsible, even in view of the 12-hour incubation period cited in 2 of the cases, the termination of the epidemic on the 18th can only be explained on the assumption that hemolytic streptococci were previously present, but had disappeared or were in very small numbers in the milk which was being included on the 17th and morning of the 18th. Recalling that the principal milker became ill on the 12th and continued to milk, the alternative explanation is that on the 14th or 15th, or both, the milk handled by him was grossly contaminated, probably through coughing or sneezing.

Basing judgment on information now at hand concerning the Savannah epidemic, the evidence incriminating the mastitis is convincing. Hemolytic streptococci, apparently of the same type, were isolated from material from the infected udder and from throat cultures. When the mastitis was discovered on the 13th it was well developed and probably had existed for several days. Allowing a 2-day incubation period, the cases with onsets on the 10th would have received their infections on the 8th and it is not unreasonable to assume that virulent organisms were then being discharged, especially in view of the history of previous injury. The milk from the affected quarter was excluded from the 13th but that from the other three quarters included. The opportunity for contamination by the milker was undoubtedly sufficient to account for the comparatively few cases which developed between the 15th and 18th.

NOTE: This report is based upon data furnished by John A. Conway, M.D., District State Health Officer, and A. E. Richmond, M.D., local health officer, who investigated the Wayland epidemic, C. R. Hervey, M.D., District State Health Officer, W. H. Sweeting, M.D., local health officer, and Robert S. Breed, Ph.D., Consultant in Dairy Sanitation, who investigated the Savannah epidemic, and on preliminary reports from the state laboratory. Both Dr. Breed and the state laboratory are, at the time of writing, engaged in further bacteriological studies.

Training and Personnel*

THE following tables similar to those presented in previous years include the data concerning students registered in schools of public health, and the public health degrees granted in the calendar year 1928.

The central office of the Association has collected certain data in an attempt to determine what happens to students after they are graduated from schools of public health. Through the courtesy of the Executive Secretary the information obtained is presented herewith. Twenty schools were questioned but only 15 were able to give sufficient information for tabulation. From 1921 to 1925 inclusive these 15 schools granted degrees to 56 women and 282 men.

Of the 338 graduates listed, information regarding 133 was missing or was insufficient to tabulate. The subsequent careers of the remaining 205 graduates are listed in Table IV.

Although the classification of occupations is general, the data are of some interest. It will be noted that 133 individuals out of 338 have practically disappeared from the field of public health. Data regarding scholarship or fellowship grants are not available from all schools. The reports indicate that at least 150 of these students held scholarships or fellowships. An appreciable number of the individuals holding fellowships were foreign students.

The following tentative statement of desirable minimum training requirements for all public health workers expresses the opinion of the committee. It is here presented for further consideration, and by vote of the committee each section representative has been requested to submit the statement to his section with the request that said section prepare a statement of the desirable further training requirements for the field of public health work in question.

MINIMUM BASIC TRAINING FOR THOSE WHO ANTICIPATE ENTERING THE PUBLIC HEALTH PROFESSION NO MATTER WHAT THE SPECIALTY MAY BE:

I. General College Training

The general college training or its equivalent should include courses in general inorganic and organic chemistry, physics, zoölogy (general biology), and, if possible, also psychology, sociology and civics.

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* Report of the Committee presented at a Dinner Session of the American Public Health Association at the Fifty-seventh Annual Meeting, Chicago, Ill., October 17, 1928.

II. Instruction Directly Related to Public Health

No suggestion is here made as to specific courses, which may be combined or subdivided in various ways at various institutions. The characteristic viewpoints of these 5 fields should, however, be represented.

1. *Physiology and Personal Hygiene*—The structure and functions of the human body and the various factors essential in building up and maintaining it in a sound, vigorous and harmonious state. Its relation to air, sunlight, water, food, shelter, exercise, rest, poisons and injury should be given due consideration. The prevention and correction of defects, periodic health examinations and mental hygiene should have their proper emphasis.

2. *Bacteriology and its Application to Public Health*—It is desirable that some reference to both sanitary and medical bacteriology be included. Data should somewhere be presented as to the nature, source and methods of the transmission of communicable diseases and their control.

3. *Public Health Engineering*—The engineer's angle of approach to the problems of water supply, waste disposal, air conditioning and milk sanitation.

4. *Vital Statistics and Epidemiology*—Fundamentals of sound elementary statistical procedures and the statistical methods employed in studying the incidence of epidemic and other diseases.

5. *Community Health Practices and Education*—The social and psychological problems involved in health organization, sound civic administration and the formation of public opinion.

All lecture courses should be supplemented by appropriate laboratory or field work.

The foregoing fundamental training should prove to be an excellent foundation upon which specialization in the various fields of public health may be built.

Training indicated under I may be secured in any college.

Training indicated under II may be secured in many colleges.

SUB-COMMITTEES AND SECTION REPRESENTATIVES

In order to strengthen its working efficiency the committee hereby empowers the appointment of sub-committees by the chairman, as occasion arises, for the pursuance of special pieces of work and the committee requests the sections of the Association to appoint section representatives on this committee for 2-year periods instead of 1-year as in the past.

RECOMMENDATIONS

The committee is of the opinion that the accumulation of data amounting to a stock taking of the training and professional status of public health workers in the United States is desirable. It is a necessary step for the committee to formulate definite recommendations for the future training, tenure of office and economic return for public health workers. In line with the report of the special sub-committee which has been studying this problem we believe that:

1. A comprehensive survey should be made of the institutional facilities and procedures now in use in the training of individuals ultimately intending to enter the professional field of public health work. The collection of such material by mail is inadequate and unsafe, since so many of the advantages or objectionable characteristics of the procedures do not appear in second-hand exchange of information by letter writing.

2. A careful and first-hand study should be made concerning the variety of extension courses now carried on by federal, state, and municipal public health

TABLE I

NUMBER OF STUDENTS ENROLLED AND PUBLIC HEALTH DEGREES CONFERRED IN 1928 IN COURSES REQUIRING AT LEAST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC HEALTH CAREER

School	*Degree*	*No. Enrolled 1927–1928*	*No. of Degrees Conferred 1928*
University of California	A.B.	12	3
	Dr.P.H.	0	0
	Ph.D.	1	1
	M.A.	0	0
University of Chicago	Ph.D.	0	7
DeLamar Institute of Public Health, Columbia University	M.S.	1	0
Detroit College of Medicine and Surgery	Dr.P.H.	0	0
University of Georgia	S.B.P.H.	1	1
	M.S.P.H.	3	3
	Dr.P.H.	3	3
Harvard School of Public Health	Dr.P.H.	3	1
	M.P.H.	4	4
	C.P.H.	6	6
Johns Hopkins School of Hygiene	Dr.P.H.	11	9
	Sc.D.	39	10
	C.P.H.	26	20
Massachusetts Institute of Technology	S.B. in P.H.	37	5
	C.P.H.	3	0
	Dr.P.H.	1	1
	Ph.D.	8	2
McGill University	D.P.H.	2	2
	B.Sc.	9	0
University of Michigan	Dr.P.H.	8	0
	M.S.	4	4
University of Minnesota	M.A.	1	0
	B.A.	1	0
University of Montreal	D.P.H.	0	0
Ohio State University	M.S.	4	2
University of Pennsylvania	Ph.D.	3	1
	Dr.P.H.	0	0
	M.A.	1	1
	M.S.	2	2
Queen's University	D.P.H.	0	0
University of Toronto	D.P.H.	7	5
	Ph.D.	2	0
	M.A.	2	2
University of Western Ontario	D.P.H.	0	0
Yale University School of Medicine	C.P.H.	7	4
	Dr.P.H.	0	0
	Ph.D.	9	3
	M.S.	7	1
Total		228	103

TABLE II

NUMBER OF DEGREES IN PUBLIC HEALTH GRANTED IN UNITED STATES AND CANADA IN 1928

Degree	*Degrees Granted*	*Schools Offering the Degree*
C.P.H.	30	4
D.P.H.	7	5
Dr.P.H.	14	9
Ph.D.	14	6
M.S. in P.H.	12	6
Sc.D.	10	1
S.B. in P.H.	6	3
M.P.H.	4	1
A.B.	3	2
M.A.	3	3
B.Sc.	0	1
Total	103	

agencies, universities, voluntary agencies, or any of these jointly, in order to acquaint the committee with the progress that has been made in supplementing the professional activities of public health workers by extramural training courses. Many in public health work are of the opinion that such extension courses made available to active workers are more effective developers of initiative and efficiency than the ordinary full-time university courses. Examples have been noted in the literature of the great value of such courses in various cities and universities. A review of such undertakings is likely to be instructive.

3. The present status of salary standards, permanence of tenure, and mode of selection of workers should be reviewed. Here again field investigation is essential, particularly with reference to permanence of tenure and mode of selection of workers, since the political, psychological, and other controlling factors in this situation are, and will continue to be, of great importance in the attempt to raise the general level of professional public health work.

4. A survey should be made of the nature, quantity, and quality of previous training of the public health workers now in active practice.

5. The use and abuse of legislative and civil service restrictions in the selection and dismissal of public health workers are matters of considerable interest. These regulations and restrictions should be carefully reviewed and tabulated, in order to determine their advantage, obsolescence, and danger. The lay public must be educated to the inherent objections or advantages in the present variety of laws and civil service requirements. Some of these requirements are helpful, others harmless,

TABLE III

PUBLIC HEALTH DEGREES CONFERRED 1921–1925

	Male	*Female*
Certificate in Public Health	57	8
Doctor of Public Health	147	4
Doctor of Science in Hygiene	20	15
Doctor of Philosophy—Public Health	9	6
Master of Science in Public Health	28	6
Master of Public Health	5	
Master of Arts in Hygiene	0	2
Bachelor of Public Health	16	15
	282	56

TABLE IV

POSITIONS HELD BY 205 GRADUATES

Teaching	76
City Department of Health	27
Laboratory Work	25
Health Officers	21
State Department of Health	17
Private Practice	11
Volunteer Agencies	9
U. S. Public Health Service	10
Bureau of Fisheries	3
United States Army	3
Editors	2
League of Nations	1
	205

and still others have proved their usefulness, primarily in affording opportunities for political interference in the appointment and dismissal of public health workers. The committee could perform an exceedingly helpful public duty by analyzing this situation in the country at large, by pointing out the demerits wherever found and ultimately by formulating recommended procedures of legislative and civil service regulation.

6. Considerable discussion arises at every session dealing with the training of public health workers as to whether or not existing medical schools contribute much or little to the instruction in preventive medicine of medical students. The content of, and the allotment of time to, the public health courses in medical schools should be the subject of further study and report.

It is recommended that this committee establish a budget and, with the aid of the administrative office of the Association, seek special funds for the employment of a part-time or full-time worker with sufficient allotment for travel expenses to perform the duties noted above and to report in detail and in writing to the Committee on Training and Personnel on the results of the study.

SALARY STANDARDS

It is the belief of this committee that the report on salary standardization made to the Association in 1922 is now in need of revision in respect to both facts and recommendations. This committee desires to undertake a revision of that report and requests the Association to approve the setting up of a budget for the purpose, the amount of said budget to be determined by the Executive Board and the work to be done in connection with the more extensive study outlined above or as a separate investigation.

Section Representatives

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E. R. HAYHURST
LILLIAN HUDSON
THOMAS KENNEY
J. F. NORTON
E. G. ROUTZAHN
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C.-E. A. WINSLOW

Local Immunization and Antivirus

NEWTON W. LARKUM, PH. D.

Michigan Department of Health, Lansing, Mich.

LOCAL immunization by means of antivirus has received relatively little attention in the medical literature of the United States. It would appear that this situation has resulted partly from a lack of faith in the reports printed in foreign journals, and partly to a lack of familiarity with such publications. Consequently it would seem advisable in a public health periodical to review the subject briefly, and to state what appears to be the present status of this method of immunization. Such a discussion must include two quite separate and distinct discoveries—one, local immunization, a conception that since in a given infection a certain tissue is primarily affected, immunization of that tissue should prevent the infection; the other, that a certain substance, "antivirus" (Besredka), contained in filtrates of old broth cultures of bacteria is the principle which can best produce this local immunity. Such antivirus is specific, and when used in the treatment of staphylococcus infections should be prepared at the expense of staphylococci.

The idea of local immunity was originated by Besredka and is fully presented in *Local Immunization.*[1] Every pathogenic bacterium is virulent for a certain tissue according to this author. Thus, the typhoid, paratyphoid and dysentery bacilli and the cholera vibrio primarily attack the mucosa of the small intestine. The anthrax bacillus is a saprophyte except in the cutaneous tissue. The staphylococcus and certain types of streptococci select the skin for their attack. Immunize these tissues and the infection cannot occur.

According to Besredka's own confession, the idea of local immunity had its genesis in a study of immunity to anthrax in guinea pigs. Ordinarily, these animals are most susceptible to this infection, yet when they were inoculated with many times the lethal quantity of anthrax bacilli in such a manner as to avoid injury to the skin or contact of bacilli with the skin, they resisted the invasion, in fact gave no symptoms whatsoever. They acquired no immunity as the result of inoculations of this type. If, however, the skin was vaccinated either by intracutaneous inoculation or by direct application of the vaccine,

the animal became immune to anthrax infection. Such an immunity was not accompanied by the presence of demonstrable antibodies, nor was it possible to immunize passively a second animal by means of a serum from a completely immunized guinea pig. There is at present little tendency to dispute these observations. In so far as anthrax is concerned, the fundamental observations have been repeatedly confirmed not alone with guinea pigs but with rabbits. The principle of "cuti-immunization" has been applied to the protection of large animals on a broad scale and in so far as may be judged by the reports available has been eminently successful.

Although not the only tissue susceptible to the attack of staphylococci and streptococci, the skin is particularly subject to infection. It may be said that these cocci have a predilection for such tissue. Consequently it was not long after the establishment of anthrax immunization by means of intracutaneous inoculation that Besredka and others attempted similar work with the pyogenic cocci. They succeeded. In animal experiments they were able to confer a very high degree of immunity by intracutaneous inoculation of killed cultures, or by application of dressings soaked in such material or soaked in filtrates of old cultures of these organisms. The success attending these experiments was not so complete as that attending anthrax immunization; yet it was considerable and sufficient to warrant the application of the method to treatment of such infections in man.

In dysentery and typhoid fever the mucosa of the small intestine is the susceptible tissue. If the organisms causing these diseases are introduced into animals by any route they will localize in this tissue. Further, by rendering such tissue more permeable through damage such as may be produced by bile, animals ordinarily immune may be made to undergo a typical typhoid or dysentery infection. Conversely, a very considerable immunity may be conferred by introduction of killed cultures into the small intestine, which preferably has been previously prepared by ingestion of a small amount of bile. Again these findings have been carried over to human application with results sufficiently striking to warrant further investigation.

Although not described in Besredka's monograph, his method of immunization has been applied to many other infections, and has become in addition a method of treatment. Tuberculosis and gonorrhea in particular have been the subject of extensive investigation. Like all problems involving treatment of man, there is required too much of detail and of control to make evaluation possible at the present time.

So much of Besredka's monograph as depends upon observed phenomena is not difficult to accept, especially in view of the ample sup-

port it has received. That part of his work bearing upon an explanation of these phenomena is less easily digested. As in the case of bacteriophage, the consideration of underlying causes bids fair to overshadow the very practical accomplishments. This is unquestionably necessary, for it is inconceivable that a therapeutic measure could come into general use without a rational basis for its acceptance. The greatest difficulty seems to concern the denial of antibodies in the immunity produced. This is, for many, a pill hard to swallow.

No brief summary can do justice to Besredka's ideas, but some suggestion of his method of reasoning may challenge a more intensive study of the theory. According to this author, immunity is largely dependent upon phagocytosis. Providing that leucocytes can be brought into contact with bacteria, phagocytosis occurs. The idea of *positive* chemotaxis Besredka rejects. Except in the presence of negative chemotaxis it is the normal function of phagocytes to approach, surround, ingest and if possible to digest foreign bodies. When a tissue is susceptible to invasion by a given organism it possesses receptors which Besredka thinks may reside in some of the reticuloendothelial cells in that tissue. These receptors in conjunction with the invading organisms produce a state of *negative* chemotaxis which prevents phagocytosis and allows the establishment of infection. Contact of the susceptible tissue with the organism, rendered noninvasive, exhausts these receptors and hence provides for immunity by making possible immediate phagocytosis upon invasion by viable organisms. The exhaustion of the receptors depends not upon the bacterial antigen but upon a substance associated with bacteria. It is present in small quantities in heat killed vaccines but is much more abundant in filtrates of old cultures. This substance Besredka calls antivirus. Hence it has come about that the terms antivirus and local immunization are practically inseparable.

No one reading Besredka's monograph or the abundant literature upon the subject can help believe that as a method, local immunization has much to recommend it. One is likely to feel equally impressed with the weakness of the theory which supports it. This fact should lead to intensive investigation either to strengthen the theory or to provide another having fewer weaknesses. French, German, and Italian investigators have attacked this problem. The literature in the English language is practically nil. It is difficult to state what is needed to bring this problem to the attention of investigators in this country. The question is so dependent upon a combined clinical and laboratory investigation that it requires a united attack by physicians and laboratory investigators such as can best be provided by a sub-

sidized group. In view of the magnitude of the problem it is not too much to hope that America will not long remain in almost complete ignorance of this subject.

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Enemies of Knowledge

ONE last word. It is possible to hold strong opinions and still to be tolerant. We must have theories, and we may believe them very implicitly, if we are to progress. A sheer accumulation of facts will gradually overwhelm the human brain, if no means of ordering them be available. We must, however, continually reflect upon the possibility that after all we may be wrong. So long as we do nothing unfair to other people and their theories, so long as we do not interfere with their liberties in the pursuit of their lawful business, our own strong beliefs, our own stupidity and ignorance, may be forgiven.

Inside the front page of a recent book on physical astronomy a friend of mine has pasted a cartoon of a young lady talking to an old fisherman: "What did you think," she says, "of last night's wireless lecture on the atom?" "Never heard such a pack of lies in my life." That, however, is not the same thing as intolerance; no old fisherman would wish to burn, to imprison, or even to pray for the deaths of Professor Eddington and Sir James Jeans. I do not much care if the Countess of X, or her friends in the Government, take the same cheerful view that the results of medical research are a "pack of lies." That is her business, and, after all, I probably have the same contempt for many of her sacred beliefs. I am content to leave the decision between us in such matters to the public intelligence. What I do protest against, and would fight against with all my strength, are calumnies and persecution, and attempts at legal interference with our liberties, wantonly intended to hinder the advance of knowledge; or national and political hatreds which prevent coöperation in the greatest of human quests; or theories, however well grounded, which their owners cannot conceive as being otherwise than true. In such matters, after all, modesty, friendliness, humanity, judgment, balanced by a reasonable sense of humour, are, as in other things, the basis of human welfare.—A. V. Hill. From *The Lancet*, June 29, 1929, p. 1388.

EDITORIAL SECTION

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LABORATORY STUDIES OF YELLOW FEVER

MORE than two years have elapsed since the discovery that the *Macacus rhesus* monkey may be inoculated successfully with yellow fever. The finding of a suitable laboratory animal opened a new era of research in yellow fever, and the work published so far has not only confirmed the essential findings of the Army Yellow Fever Commission under Walter Reed, but has also made a considerable addition to new knowledge.

The discovery that yellow fever is transmissible from man to monkey was made by Stokes, Bauer, and Hudson[1] of the West African Yellow Fever Commission of the Rockefeller Foundation. It was confirmed in Senegal by Mathis, Sellards, and Laigret,[2] and later in Brazil by Aragão.[3] The virus soon became available for study in Europe and America, as Sellards[4] was able to transport it in frozen monkey liver from Senegal to England, and from there to the United States. Later it was sent successfully from Nigeria direct to the United States under various methods of preservation. Up to the present, yellow fever virus from West Africa has been studied, through the use of monkeys, in Lagos, Accra, Dakar, London, Paris, Berlin, Amsterdam, Rio de Janeiro, Bahia, Boston, and New York, and the virus from South America has been similarly investigated in Rio de Janeiro, Bahia, and New York. The methods of preservation of the virus for storage or for shipment between laboratories have been improved step by step until it is now possible, according to Sawyer, Lloyd, and Kitchen,[5] to desiccate blood-virus in the frozen state and keep it in sealed tubes for at least 150 days.

One of the great needs in yellow fever control operations and in the preliminary epidemiological studies is a specific diagnostic test by

which the mild and recovered cases can be identified and the endemic areas ascertained. As yet no simple and inexpensive test has been found, but it is possible, by the use of monkeys, to determine whether a person has had yellow fever. The serum from a recovered patient, when injected in suitable amounts, will protect a susceptible monkey against a subsequent inoculation of the virus.

The monkey commonly used is the *Macacus rhesus* from Asia, but several other species of the same genus are susceptible, and Davis and Shannon[6] have found that a South American monkey, *Cebus macrocephalus,* is possibly slightly susceptible. By means of such protection tests Theiler and Sellards[7] and also Hudson, Bauer, and Philip[8] have shown that the serum of persons who had recovered from yellow fever in the Western Hemisphere protected against African strains of the virus. One of the protecting serums had been taken from a person who had had yellow fever in Peru 7 years before. These experiments add to the evidence that yellow fever as found in Africa is the same disease as that found in the Americas.

Bacteriological studies of yellow fever in monkeys have, as a rule, failed to reveal any organism which could be considered the cause of yellow fever. The single outstanding exception is the announcement by Kuczynski[9] of a bacterial organism which he believes is related to the disease. The filterability of the virus in blood serum has been again demonstrated by Stokes, Bauer and Hudson[1] and the causative agent is generally considered to be one of the filterable viruses. This classification has recently been supported by the discovery by Torres[10] of intranuclear inclusions in the liver cells of monkeys which had been inoculated with Brazilian strains of yellow fever virus. These inclusions are made up of clusters of acidophilic particles and are suggestive of the intranuclear inclusions of herpes. Similar inclusions were later found by Torres[11] in monkeys inoculated with African virus. The intranuclear inclusions have been studied by Cowdry and Kitchen,[12] who found them in monkeys inoculated with an African strain of yellow fever and also in human yellow fever tissues from Africa and the Western Hemisphere. Pathological studies of the tissues of monkeys dead of yellow fever have been made by Hudson,[13] who is of the opinion that the lesions are strikingly parallel to those produced by yellow fever in man.

The virus of yellow fever is easily transmitted from monkey to monkey by the mosquito *Aëdes* (*Stegomyia*) *aegypti,* the well known transmitter of yellow fever and dengue. By the use of laboratory animals, the virus in the mosquito can be studied more closely than formerly when the work involved the use of human volunteers. The

incubation period in the insect has been found, by Bauer and Hudson,[14] to vary from 9 to 12 days, and they demonstrated also that the mosquitoes contain virus in infectious form throughout the incubation period, although their bites are then harmless.

Perhaps the most significant result of the studies of the mosquito is the finding that the common stegomyia is not the only mosquito capable of transmitting yellow fever. A number of species have been studied in Africa by Bauer,[15] and under laboratory conditions yellow fever was transmitted by the bites of the following species: *Aëdes luteocephalus, Aëdes apicoannulatus,* and *Eretmopodites chrysogaster.* It is still a matter of speculation whether any of these three species helps spread yellow fever under natural conditions.

The work of the Army Commission in Cuba and the general experience with post-mortem examinations had shown that objects contaminated by yellow fever patients and the bodies of persons dead of yellow fever are not dangerous. It appears, however, that those who work with the highly infectious blood or liver emulsion of infected animals are in great danger. Eight accidental infections with yellow fever have been reported in bacteriologists working in laboratories with the experimental disease in monkeys, and 4 have lost their lives: Adrian Stokes, Hideyo Noguchi, William A. Young, and Paul A. Lewis. The method of entry of the virus was a mystery to those infected. It was shown by Bauer and Hudson,[16] however, that the virus may infect monkeys through the intact skin, when virus-bearing monkey blood is applied. This may help explain the tragic laboratory accidents. Injections of convalescent yellow fever serum have been used in Africa as a preventive after minor accidents in the laboratory.

A safe method of active immunization against yellow fever is urgently needed to protect individuals in epidemic and endemic areas and also the persons engaged in yellow fever investigation and control. A vaccine has been prepared by Hindle[17] from cytolyzed monkey liver and spleen tissue to which 2 parts of formaldehyde per 1,000 have been added. This vaccine has protected monkeys against inoculation with yellow fever virus, and the British Colonial Office is considering giving it a trial in West Africa. In Brazil, Aragao[18] made a vaccine from monkey tissues to which phenol and formaldehyde were added. This vaccine has already been administered to many thousands of persons; but, because of the poor results obtained, its use has recently been abandoned. It will take time, therefore, to determine the degree of protection to be expected through the use of these vaccines in human beings.

The high protective power of convalescent serums of man or

monkey has led to experiments to produce even more potent serums by hyperimmunization of animals. Pettit, Stefanopoulo, and Frasey[19] have prepared potent immune serums from various animals including monkeys and horses. Unfortunately, immune serums appear to be of no avail in the treatment of yellow fever in man or monkey after symptoms are established.

The journals are constantly bringing forth the announcement of new results of yellow fever research. Each increase in knowledge should hasten the day when yellow fever control measures can be simplified, and made easier of application among primitive peoples.

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LEADERSHIP IN AMERICAN PUBLIC HEALTH

LEADERSHIP in American public health now rests with the southern states. Not only have they made the greatest progress in recent years in the organization of their public health services but they seem to show most promise in their readiness and ability to extend and perfect their organizations to the point of adequacy. The richer and more complacent northern and eastern areas of the country have much to learn from their sister states below Mason and Dixon's line. It is hoped that they will not lose much time in profiting from the admirable lesson.

The history of this shifting of leadership to the southern states is full of interest. Massachusetts was the first state to develop a public health department as we now conceive it. Under the inspiration of Shattuck, Walcott, Bowditch, Abbott, and later Professor Sedgwick, Massachusetts showed the way to the rest of the country. New Jersey, Michigan and New York early did sanitary work of a high order, and New York State especially reached an enviable position later through the constructive genius of Hermann M. Biggs. But while these and other northern states were perfecting their centralized or-

ganizations, a new development began in the South. The surface of public health effort had barely been scratched in this large area of the country. Health problems of the first order called for attention. Under able guidance and the coöperation of state and federal health officials, a host of local health activities began to spring up. The keynote of this work was the perfection of local units of rural health service. Their plan called for decentralization rather than the perfection of the state health office.

From the very beginning, the International Health Board of the Rockefeller Foundation aided the organization of well conceived local full-time services in a number of states by contributing funds and the services of its staff. Primarily concerned with the control of hookworm disease, these local health units later were strengthened and took on the other functions of a well organized health agency. North Carolina did pioneer work in this field; later Alabama and Mississippi and, more recently, Tennessee, have perfected organizations approaching a state-wide basis of full-time county health units. Virginia, Kentucky, Louisiana, South Carolina, Georgia, Arkansas, Maryland and Missouri have taken up the program.

To facilitate the manning of local units with competent personnel, thriving stations for the training and appraisal of health officers, sanitary inspectors, and nurses are to be found in a number of states. Today, we find in the South a vigorous and growing movement for the completion of health organization on this tried and proven basis of full-time, competent county health service. There is no part of the country where more vigorous rural health activity can be seen in operation, where money is being spent more wisely, and where better results are obtained than in the South.

It is literally true that when health observers from abroad come for the study of our best rural work, it is necessary to take them to such southern states as Mississippi and Tennessee rather than to the northern states where health work has been in operation much longer and where brilliant achievements were recorded in the past. Possibly it would be more charitable to say that health work in most northern states, being older, has reached a more or less static condition in relation to basic needs. But there is little to inspire in this situation.

It would be unfair, however, to say that the new development is entirely limited to the South. The movement for full-time county health service early made its impress in Ohio where the organization is as extensive and as effective as anywhere, but Ohio is rather an exception among the northern states. Michigan is beginning to come along.

Iowa and Wisconsin have just passed admirable permissive laws for county health service. There are indications of murmurings which presage a similar movement in other states of the North and East in the immediate future. New York has recently shown that it is possible under its law to organize on the full-time county unit plan. But there are only a few units, where 50 or 60 are possible. It would be a great gain to the whole movement if New York State could organize itself widely on the full-time county plan functioning with the traditional efficiency of this state's health department. When this happens, a new era in American health work will be ushered in.

THE IODINE CONTENT OF FOODSTUFFS

AN interesting study which has great possibilities is being carried on in South Carolina by the departments of physiology and pathology of the Medical College of the state (the field force of the State Board of Health), and several physicians.

In 1928 the legislature created a commission and provided funds for studying the mineral elements of foodstuffs growing in the state. The prime mover was Dr. William Weston, a pediatrician, whose interest was aroused through the problems of nutrition. The analyses are being done by Prof. Remington of the Medical College.

While similar data for the entire country are not available for comparison, it can be said that the vegetables grown in South Carolina contain from twenty to thirty times as much iodine as those produced in California and Oregon. An unexpected finding is that the vegetables from the Piedmont region are somewhat richer in iodine than are those grown in the coastal belt. The green leafy vegetables show the largest amounts of iodine and are also the richest in vitamins and iron. The root crops are also rich in iodine, but grains, regardless of where they are grown, are poor in this element.

It has been found that the river water which showed the highest content of iodine is some 150 miles from the coast. This particular stream did not contain other salts, which would indicate that they were derived from wind-borne spray from the sea. These findings are contrary to the former theory that iodine and other salts were obtained from the ocean through wind-blown spray. Another theory seems to have been disproved by the analyses as far as they have gone. Nitrates from Chile have been used to a considerable extent as fertilizer, and some have supposed that iodine was derived from this source. However, Chilean nitrate contains only a few hundredths of one per cent of iodine and the section of the state which shows the highest

goiter incidence and the lowest amount of iodine in the foodstuffs is that in which Chilean nitrate has been most largely used over a number of years. On the other hand, such vegetables as peas and beans, which contain large amounts of iodine, are not fertilized with nitrate.

The examination for service during the World War showed that those drafted in South Carolina had an incidence of simple goiter of 0.25 to 1.00 per 1,000. The findings, so far, indicate that in South Carolina, at any rate, the vegetables are a more important source of iodine than the water supplies.

Certain preliminary analyses indicate that those foods which are rich in iodine are also relatively rich in iron and manganese. It has already been pointed out that the vegetables which are richest in iodine are also rich in vitamins and iron.

The studies are to be continued, combined with feeding experiments. The results are interesting and important, and we hope that they will serve to broaden the investigations on endemic goiter from a study of waters, to which they have so far been largely confined, to the elements concerned in nutrition.

Epidemiology Section

THE Executive Board at its meeting, December 8, 1928, appointed officers for the Section on Epidemiology, established by the Governing Council October 18, 1928, in Chicago.

The organization of this section is intended to meet a definite need for a group of earnest public health workers who are primarily interested in the study and the practice of epidemiology, by whatever title the bureau or department to which they belong may be designated.

Fellows and members of the Association who are at present engaged in lines of work where their major interests are in this field, should designate to the Executive Secretary their desire for a connection with the Section on Epidemiology and apply for transfer. Persons interested in this field who are not now members of the Association should find in this section an outlet for their contributions to the subject, and stimulating contact with those in similar fields, in state or city departments.

Applications for transfer from other sections, and applications for membership to this section should be in the hands of the Executive Secretary of the Association well in advance of the Minneapolis meeting.

A stimulating program has been prepared for the meetings of this section, as well as for the joint meetings with the Health Officers' Section and the Laboratory Section.

DON M. GRISWOLD, *Chairman*
E. S. GODFREY, JR., *Vice-Chairman*
HAVEN EMERSON, *Secretary*

ASSOCIATION NEWS

Minneapolis Will Entertain Her Guests

MINNEAPOLIS is a convention city, not only for its new Municipal Auditorium, excellent hotel accommodations, accessibility by rail, airplane, or motor car, but also because of its great educational institutions, the large measure of health consciousness among its people, its natural beauty, remarkable scenic development, and its hospitality toward its visiting guests.

The American Public Health Association, the American Child Health Association, the International Society of Medical Health Officers, the American Social Hygiene Association, the American Association of School Physicians, the Conference of State Sanitary Engineers, and the State Laboratory Directors are among the guests Minneapolis delights to honor.

It is happy to be assisted in their entertainment by the State Sanitary Conference, the Minnesota State Public Health Association, and the State Nursing Organizations. With this unique occasion it will associate the third annual session of the Northwest Conference for Child Health and Parent Education, and, finally, under the joint auspices of the American Public Health Association, and the Northwest Conference, the first Educational Health Exhibit for the benefit of the people at large will be presented. A prospectus of the Exhibit will be issued soon.

ENTERTAINMENTS AND TRIPS

1. The health organizations are invited to join the University of Minnesota in the Dedication of the Public Health Pavilion upon the Medical Campus on Tuesday, October 1, 1929, at 9:00 A.M. The program follows:

   a. Welcoming Address, by Dr. Lotus Delta Coffman, Chancellor of the University of Minnesota
   b. Dedicatory Address, " The Doctor, the Health Officer, and the Community," by Dr. C.-E. A. Winslow, Director of the Anna M. R. Lauder Department of Public Health, Yale University
   c. An Address upon " The Evolution of Student Health Services," by Dr. Harold S. Diehl, Director of the Minnesota Service and Chief of the Department of Preventive Medicine and Public Health
   d. An Address upon " The University in Relation to Public Health Work," speaker to be announced later

The program will be followed by a complimentary luncheon in the Ball Room of the Minnesota Union.

2. A drive will be arranged through the immediately surrounding lake district to the Glen Lake Sanatorium and the Children's Preventorium for Tuberculosis, an institution of 660 beds. Buffet Luncheon will be served.

3. A drive to the University of Minnesota Main Campus and the Agricultural Campus—the fourth university in point of registration in the United States.

4. A trip to the hospitals and educational institutions of the Twin Cities for the care and rehabilitation of the handicapped, including the Minnesota Hospital for Crippled Children, the Shriners' Hospital, the Arthur J. Gillette State

Hospital for Crippled Children and the Michael Dowling School.

5. A visit to the Citizens' Aid Building, the unique home of the social and health agencies of the city.

6. A visit to the University Medical Schools, and the University Hospitals, including the Cancer Institute, the Frank C. Todd Memorial Clinic and the Eustis Hospital.

7. A trip for the sanitary engineers and State Sanitary Officers to the water filtration plants and to the proposed sites for river purification plants.

8. A trip to the milk producing, pasteurizing and distributing plants.

9. A trip to the Minneapolis flour mills.

10. Two alternative drives for visiting ladies:

a. To Lake Minnetonka and intervening lakes and boulevards, ending up with an afternoon tea at the Minneapolis Art Institute

b. Around the lakes and boulevards surrounding the city, to the Falls of Minnehaha, returning by the River Roads and the Victory Drive, ending up with an afternoon tea proffered by the Minnesota State Organization for Public Health Nursing at the Minneapolis Woman's Club

11. A trip to the hospitals and public institutions of Saint Paul, to be offered by the profession and the citizens of the city's twin, is suggested.

12. At the Opening General Session of the Visiting Health Organizations, on Monday evening, September 30, a dance will be given by the Local Committee at the Hotel Nicollet.

13. The Minnesota State Public Health Association will arrange a dinner at the Hotel Nicollet, on Tuesday evening, October 1, to be followed by an interesting program of speakers and musical entertainment (Tickets, $2.00).

14. The Annual Banquet of the American Public Health Association and its allied organizations will be held on Thursday evening, October 3, in the Grand Ball Room of the Hotel Nicollet (Tickets, $2.50). At the after-dinner program, Dr. George Edgar Vincent, President of the Rockefeller Foundation, will make the opening Address. Other speakers will be announced. The banquet and program will be followed by a dance given by the Local Committee.

15. A special trip, by fast railway service, to the Mayo Clinic and the Mayo Foundation, Rochester, Minn., will be provided late on Friday evening, October 4; leaving Minneapolis at 9:40 P.M. A research health program will be presented for Saturday morning, October 5. Visits to hospital clinics will be arranged.

A complimentary luncheon will be arranged for Saturday noon, followed by an informal program, and an early afternoon visit to the Saint Mary's and the Kahler Corporation Hospitals.

Trains will leave Rochester for Minneapolis at 4:00 P.M., and for Chicago at 9:30 P.M. on Saturday.

The guests of Minneapolis for the public health meetings will greatly facilitate the work of the Local Committee if they will make *advance reservations* (1) for the University Dedication Exercises and Luncheon on Tuesday morning; (2) for the Minnesota State Public Health Association dinner on Tuesday evening; (3) for the Annual Banquet on Thursday, October 3; and (4) for the Mayo Visit and luncheon. Its officers will be gratified if reservations are also made, so far as possible, in advance, for other entertainments and trips.

Address: Richard Olding Beard, M.D., Executive Secretary for the Local Committee, 324 Citizens' Aid Building, Minneapolis, Minn.

Sedgwick Memorial Medal





THE Sedgwick Memorial Medal Committee has accepted a design for the Sedgwick Memorial Medal prepared by Mary Hooker Donelson. This design was selected as the prize winning design in a contest arranged by Professor E. O. Jordan in coöperation with M. J. Rosenau, M.D., and Robert Spurr Weston.

This medal is given in memory of the late Professor William T. Sedgwick, who was President of the American Public Health Association in 1915. It was made possible by a contribution of funds by Professor Sedgwick's friends and former students. The medal is to be awarded for distinguished service in public health work, the winner of the award to be selected by the Sedgwick Memorial Medal Committee of the American Public Health Association, from candidates who have been nominated for this purpose.

It is expected that the first award of the medal will be made at the 58th Annual Meeting of the Association at Minneapolis, Minn., during the week of September 30. Nominations should be addressed to the Secretary, Homer N. Calver, 370 Seventh Avenue, New York, N. Y.

EVA F. MACDOUGALL NEW EDITOR

Since the February, 1927, issue of the JOURNAL, Miriam Ames, R.N., Assistant Director, Visiting Nurse Service, John Hancock Life Insurance Company, has edited the Public Health Nursing Section. Recently, however, because of the pressure of her work with that company, Miss Ames has found it impossible to continue her work for the Journal.

Eva F. MacDougall, R.N., Director of the Division of Public Health Nursing, Indiana State Board of Health, has been appointed editor of the Public Health Nursing Section in Miss Ames' place, and begins her contributions with the present issue.

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association, the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received 15 days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Minneapolis will be elected for the three-year term, 1929–1932.

T. B. Beatty, M.D.,
State Health Commissioner,
Salt Lake City, Utah

E. L. Bishop, M.D.,
State Health Commissioner,
Nashville, Tenn.

A. J. Douglas, M.D.,
City Health Department,
Winnipeg, Man.

William A. Evans, M.D.
Chicago Tribune,
Chicago, Ill.

I. S. Falk, Ph.D.,
Department of Hygiene and Bacteriology,
University of Chicago, Chicago, Ill.

John A. Ferrell, M.D.,
International Health Division,
New York, N. Y.

Prof. J. G. Fitzgerald,
Connaught Laboratories,
University of Toronto, Toronto, Ont.

A. H. Flickwir, M.D.,
Health Officer,
Fort Worth, Tex.

W. H. Frost, M.D.,
Johns Hopkins University,
Baltimore, Md.

J. C. Geiger, M.D.,
University of California Medical School,
Hooper Foundation, San Francisco, Calif.

Don M. Griswold, M.D.,
Deputy Health Commissioner,
State Dept. of Health, Springfield, Ill.

Prof. Ira V. Hiscock,
Department of Public Health,
Yale University, New Haven, Conn.

Thomas G. Hull, Ph.D.,
Diagnostic Laboratory,
Department of Health,
Springfield, Ill.

John F. Norton, Ph.D.,
Department of Health Laboratory,
Herman Kiefer Hospital,
Detroit, Mich.

H. L. Rockwood, M.D.,
Health Commissioner,
Cleveland, O.

Clyde C. Slemons, M.D.,
Health Officer,
Grand Rapids, Mich.

H. A. Streeter, M.D.,
City Isolation Hospital,
Manchester, N. H.

Benjamin White, Ph.D.,
Antitoxin & Vaccine Laboratory,
Jamaica Plain, Mass.

Huntington Williams, M.D.,
State Department of Health,
Albany, N. Y.

Shirley W. Wynne, M.D.,
Health Commissioner,
New York, N. Y.

NOMINATING COMMITTEE

James Roberts, M.D., *Chairman*
C. C. Young, D.P.H. Abel Wolman

PHOTOGRAPHS OF PAST PRESIDENTS

There is being assembled in the Executive Office of the Association a collection of photographs of past presidents of the Association. This collection is fairly complete for recent years, but the assistance of members and Fellows of the Association is requested in filling the many gaps in this gallery. The only photographs which we have been able to secure of presidents previous to 1900 are those of the first 10 presidents, and the following:

Henry P. Walcott—1886
George M. Sternberg, M.D.—1887
Samuel H. Durgin, M.D.—1893

Subsequent to 1900 the collection is complete with the exception of the following:

Benjamin Lee, M.D.—1901
Walter Wyman, M.D.—1903
Domingo Orvananos, M.D.—1907
G. T. Swarts, M.D.—1909
R. M. Simpson, M.D.—1911
Rudolph Hering, Sc.D.—1913

Any member or Fellow of the Association who may have or have access to pictures of any of the past presidents which are not included is urged to communicate with the Executive Secretary.

NEW MEMBERS

I. Alexa, M.D., C.P.H., Iasi, Roumania, Instructor in Bacteriology (Assoc.)
James M. Brannon, Ph.D., Urbana, Ill., Dairy Bacteriologist
A. D. Brewer, M.D., Bozeman, Mont., City-County Health Officer
Ethel G. Bright, R.N., Swainsboro, Ga., Emanuel County Nurse
Eula B. Butzerin, R.N., Minneapolis, Minn., Director of Course in Public Health Nursing, University of Minnesota
Belle Carver, R.N., Brooklyn, N. Y., Industrial Nurse, United States Rubber Co.
C. A. Christensen, M.D., Dearborn, Mich., Commissioner of Health
T. C. Colley, M.D., Keller, Tex., Health Officer of Tarrant County
Joseph R. D'Aunoy, M.D., New Orleans, La., Director of Laboratories, Charity Hospital
Harold S. Diehl, M.D., Minneapolis, Minn., Director, Student's Health Service
Zephirin Dupuis, M.D., L'Assomption, P. Q., Medical Officer
M. A. Fort, M.D., Dr.P.H., Bainbridge, Ga., Health Commissioner of Decatur County
J. P. Greenhill, M.D., Chicago, Ill., Obstetrician and Gynecologist
Anna J. Haines, R.N., Boston, Mass., Executive Secretary, Boston Health League
Mrs. Lynn G. Hooper, R.N., Jackson, Miss., Supervising Nurse, Hinds County Health Department
Roy C. Kester, Greenville, O., Chief, Division of Sanitary Inspections, Darke County Health Department
James F. King, B.S., Atlanta, Ga., State Chemist
Jordan Lally, M.D., New York, N. Y., Industrial Physician, United States Rubber Co.
Eugene M. McCarty, M.D., Rumford, Me., Medical Director of the Oxford Paper Co.
Carl C. Mann, Arlington, N. J., Industrial Physician, DuPont Viscoloid Co.
Agnes E. Maynard, R.N., Hamilton, N. Y., Supervising Nurse, State Department of Health
Fredrika Moore, M.D., Boston, Mass., School Health Worker, State Department of Health
Mary R. Noble, M.D., Harrisburg, Pa., Chief, Preschool Division, State Department of Health
Henry G. Oldfield, M.S., Minneapolis, Minn., Assoc. Sanitarian, Milk Sanitation, State Department of Health
George M. Piersol, M.D., Philadelphia, Pa., Medical Director, Bell Telephone Co.
William Pralle, Houston, Tex., Assistant Engineer, Department of Health
Ella H. Rigney, New York, N. Y., Publicity Director, American Society for Control of Cancer
John O. Salyers, M.D., Hazard, Ky., Director of Health, Perry County
Sherwood H. Smith, A.B., Jacksonville, Fla., Executive Secretary, Florida Public Health Association
Antonio Vidal, M.D., D.P.H., Honduras, C. A., General Inspector of Public Health (Assoc.)
Samuel B. Woodward, Worcester, Mass., President of the Worcester County Institute for Savings (Assoc.)

APPLICANTS FOR FELLOWSHIP

PUBLIC HEALTH EDUCATION SECTION: B. S. Stephenson, M.D., Sidney, O.
FOOD, DRUGS AND NUTRITION SECTION: John S. Abbott, Washington, D. C.
CHILD HYGIENE SECTION: Ada McMahan, M.D., Lafayette, Ind.
HEALTH OFFICERS SECTION: Charles H. Benning, M.D., Royal Oak, Mich.; David M. Cowgill, M.D., Twin Falls, Ida.; Gordon T. Crozier, M.D., Valdosta, Ga.; Walter W. Lee, M.D., Indianapolis, Ind.
PUBLIC HEALTH NURSING SECTION: Elsbeth H. Vaughan, St. Louis, Mo.
VITAL STATISTICS SECTION: Mary A. Clark, New York, N. Y.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Diphtheria Prevention in New York City—It was the ancient custom to shake a rattle to keep the evil spirits of disease away. Today we keep the "evil spirits" away by "shaking the rattle" of the mighty microphone, the far-flung film, the trenchant pen, the powerful printing press and mostly by the patient work of great scientists.

The Diphtheria Prevention Commission of the New York City Department of Health records the results of 5 months of modern "rattling" to conquer the evil spirits of diphtheria: 300,000 toxin-antitoxin injections administered; 100,000 children immunized. More than 50 per cent have been of preschool age. Nearly 50 per cent have been treated by private physicians; 120,000 placards displayed for 7 weeks in the subways, elevated, street cars, buses, ferries, etc.; 500,000 homes received pastoral letters issued by Cardinal Hayes, and a message from Bishop Thomas E. Molloy; 2,000,000 pieces of literature have been distributed—some translated into Yiddish, Finnish, Italian, Polish, Greek, Spanish, Japanese and Lithuanian; 5,200,000 people heard our diphtheria movietone in the theatres; 300,000 copies of six Health Tabloids issued; 25,000 handbooks of information issued; 200,000 families canvassed by family physicians; 4,000,000 pieces of literature are being distributed with the statements of gas and electric companies; 11,345 waiting room cards distributed to physicians for permanent posting in their reception rooms; 86 diphtheria stations in operation for those who cannot afford the services of private doctors; 10,000 letters sent each month to mothers whose babies reach their 9th month; 36 daily newspapers and 83 weeklies and semi-weeklies in foreign languages carry our news messages; 2 of the largest moving electric signs in the world are being utilized for our diphtheria message through the generosity of companies operating these signs; 6 "Healthmobiles"—newly equipped Diphtheria Protection Stations on wheels—are carrying diphtheria protection to those children in the congested districts of New York whose parents cannot afford either a physician or a summer holiday. Each truck is manned by a doctor and 2 nurses.

The plan for the fixing of minimum fees for diphtheria immunization to enable the mass of people of moderate means to patronize the private practitioner is now well under way.

Coöperating with the Board of Education Census every home in the Bronx (population 951,900—equal to the whole population of Boston) is now being canvassed, and all children under 15 years—estimated at 150,000—are being followed through to demonstrate the possibility of a diphtheria-free borough.

Seven hundred and fifty 24-sheet posters were displayed at strategic outdoor places throughout the city for 1 month. Fifty of New York's leading citizens constitute the Diphtheria Prevention Commission.

Nine distinguished pediatricians, headed by Dr. Bela Schick and representatives of the 5 county medical societies, constitute a Technical Consultation Board.

Twenty-one leading social welfare and

health organizations comprise an Executive Board of Coöperating Agencies.

Thirty-two editors of newspapers have formed an Editorial Consultation Board.

One hundred and seventy-nine prominent foreign born men and women nominated by 35 Consul Generals serve on a Foreign Groups Committee.

The City of New York under the leadership of Mayor James J. Walker and the immediate supervision of the Health Commissioner, Dr. Shirley W. Wynne, has placed the resources of the Department of Health at the disposal of the commission to the end that diphtheria be wiped out in New York.

The diphtheria campaign is being conducted with funds donated by public spirited groups interested in the public health.—Edward Fisher Brown, Director, Diphtheria Prevention Commission.

General Files for Small Health Departments—The large number and variety of subjects about which health departments have correspondence, together with the necessity for maintaining files of information, make it absolutely essential that there be a general filing system which is simple and effective. The test of effectiveness is twofold: first, the ability to file rapidly and easily, and second, the ability to find material with equal ease and rapidity.

The Racine Health Department is using a general filing system based upon the *Appraisal Form for City Health Work*. The numerical plan of filing is followed, with alphabetical subject index.

The general subject headings under which the filing is carried out, as based upon the *Appraisal Form*, is shown in Table I.

It is impossible in the space here available to go into detail and set forth all of the 1,000 titles. A few divisions are therefore shown as a general guide. Each class of 100 numbers is again subdivided into 10 groups of 10 numbers each (see Table II).

TABLE I

GENERAL CLASSIFICATION

Class	*Numbers*	*Subjects*
0	1–100	Administration
I	101–200	Vital Statistics & Records
II	201–300	Public Health Education
III	301–400	Preventable Diseases
IV	401–500	Maternal and Child Welfare
V	501–600	Food and Sanitation
VI	601–700	Medical, Nursing, Hospital and Clinics
VII	701–800	Reserved for future use
VIII	801–900	Coöperating Agencies
IX	901–1000	Miscellaneous Topics

TABLE II

DIVISION OF CLASSES INTO GROUPS (CLASS 0)

1–100	*Administration*
1–10	Organization
11–20	Personnel
21–30	Finance
31–40	Policy
41–50	Reports, outgoing
51–60	Reports, incoming
61–70	Permits and Licenses
71–80	Inventory
81–90	Supplies
91–100	Miscellaneous

The other groups are subdivided in similar manner. For example, group II, which is Public Health Education (201–300), includes sub-titles given in Table III, to each of which 10 numbers are assigned.

TABLE III

DIVIDING CLASSES INTO GROUPS

201–300	*Public Health Education*
201–210	Health Department Publications
211–220	Other Publications
221–230	Lectures
231–240	Exhibits
241–250	Health Department Library
251–260	Open
261–270	Open
271–280	Open
281–290	Open
291–300	Open

Each of the groups is again divided into 10 unit numbers. For example, in group V, Food and Sanitation (501–600), we take group 511–520 for illustrations (see Table IV).

TABLE IV

DIVIDING GROUPS INTO UNITS

511–520	*Milk and Cream*
511	Farms
512	Dairies
513	Stores (cf. 531–540)
514	Examinations
515	Licenses
516	Ordinances (cf. 2)
517	Grading
518	Adulteration
519	Studies
520	Other cities

In each group there remain a number of unused numbers and titles to allow for the addition of new titles which may be needed. This is in addition to the group of 100 numbers above mentioned which is also being held in reserve.

The necessary equipment and material for the installation of this filing system together with the cost are shown in Table V.

TABLE V

EQUIPMENT

1	4-drawer steel letter size vertical file	$57.00
10	press board guides, metal tab, center position	1.20
100	press board guides, left hand position, tab	6.00
1000	manila letter folders, 1/3 cut, right hand position	19.00
1	visible index binder, capacity 1500 titles	16.00
1500	visible index file cards	8.25
	Total	$107.45

Any office supply dealer will be able to furnish this equipment, which is the standard equipment used for "direct name" systems of filing. The metal tabbed guides are to designate the 10 main divisions, of 100 numbers each. The left hand tabbed guides are for the sub-groups of 10 numbers each. Each unit number has a folder.

Preparation of the system consists first in drawing up the general plan and assigning classes, groups and unit numbers to appropriate titles. For each title a folder is then prepared. Folders are also prepared with numbers only for the untitled numbers to be held in reserve.

The index consists of a visible card for each main group, sub-group and unit number. These are numbered and titled, using "capital and lower case" for the unit number titles and "full capitals" for the sub-groups and main groups. The index cards for each class title bear the list of titles and numbers of groups included. Index cards for groups bear the list of titles and numbers of unit numbers included. In Table IV, there will be noted parentheses (cf. —). These are cross index references. An example of cross indexing is as follows:

In Class 0, group 1–10 is "Organization" and title 2 is "local ordinances." Following this we have cross reference number 501–600. This refers us to Class V, Food and Sanitation, under which we find in group 511–520 Milk and Cream, unit number 516 "ordinances." We also find 526 referring to meat ordinances, 536 store ordinances, 546 restaurant ordinances and 556 other food handlers' ordinances. Note that in group V all unit numbers referring to ordinances end in the same digit "6."

It must further be noted that to make such an index practical, all titles consisting of more than one word should appear in the alphabetical index under the initial letter of each word, for example—Periodic Physical Examinations (309) should appear in the index under "P" and "E" and the title Diphtheria Prevention Clinics should appear alphabetically under "C," "D," and "P."

We have now been using this file for 2 years and find that it practically eliminates the personal equation in filing. When we begin to search for a letter about a given topic it makes little difference from what point of view we approach the subject. If it is about diphtheria we will find it alphabetically so indexed. If it is about diphtheria immunization it will be indexed under both diphtheria and immunization. If it is about educational publicity con-

cerning diphtheria immunization it will be indexed under diphtheria, immunization, education and publicity. The labor involved in keeping this system is small after the initial preparation. If it is carefully planned with a view to the needs of the particular department for which it is designed, few new titles will need to be added. By providing a space on the letter head for entering the file number and determining this number at the time of dictation, both filing and finding are quick and simple procedures. We do not yet see any need for transferring in the near future and it is quite possible that no transferring will be needed until 5 years have elapsed. Some of the titles are little used, and yet it is these very titles which will confuse a straight alphabetical subject file. The time consumed in filing our correspondence has not exceeded 30 minutes per day.

This system can be expanded indefinitely. If sub-titles are required for the unit titles they can be provided by using decimals, and this is frequently desirable for special files. It can also be extended beyond 1,000. In fact, we have so extended it by using the numbers above 1,000 to designate the pamphlet cases in which we file our journals and the publications of other organizations, such as city and state health departments, national organizations, cooperating local organizations and commercial agencies.

A complete outline of the system will be sent in response to requests for the cost of preparation, which is $.75 each, payable to the City Treasurer, Racine, Wis.—W. W. Bauer, M.D., Commissioner of Health, Racine, Wis.

Warwick Town, Rhode Island—Rhode Island in 1927 won the prize in connection with the health studies made by the Women's Federated Clubs. The prize consisted of a special health survey of Warwick, the town chosen by the state health commissioner, which was made by the Committee on Administrative Practice of the American Public Health Association, and was coöperated in by the American Child Health Association.

As a result of the survey, the town council decided to form a health unit with a full-time health officer, and at the financial town meeting in May, 1929, there was appropriated $10,000 for the establishment of a unit, to consist of a full-time health officer, 2 nurses and a sanitary inspector. The town council and the financial town meeting are to be commended for their action, but they should see to it that local politics and deferment of action do not prevent the speedy formation of a health unit, which would be a great asset to a rapidly growing urban community that has some special sanitary problems.—James Wallace, M.D., Associate Field Director, A. P. H. A., New York, N. Y.

Influenza Surveys—Realizing that influenza is an extremely poorly reported disease throughout the United States, and that morbidity reports could therefore not be expected to give a true picture of the actual incidence of the disease, the U. S. Public Health Service decided to carry on a nation-wide survey to determine with some degree of accuracy the real incidence of influenza and the frequency with which it was preceded by, associated with, or followed by, some other condition such as pneumonia, or a cold. The Detroit Department of Health has coöperated in this survey. In Detroit a house-to-house canvass was made in 20 representative districts which included visits to 6,700 homes. In all 18,056 individuals are included in the personal histories obtained but of this number only 17,814 gave sufficient complete information to be included in the survey.

The results of this survey covering the months of December, 1928, and

January, 1929, indicate that 23.9 per cent of the population suffered from one or another of the respiratory infections —colds, influenza or pneumonia. In all 13.2 per cent gave a history of influenza; 1.7 per cent had grippe; and 0.4 per cent suffered from pneumonia. The incidence of 23.9 per cent for the respiratory infections is appreciably lower than the incidence found in the U. S. Public Health Service survey for some of the western cities and slightly lower than most of the midwestern or eastern cities with the exception of Baltimore. The total number of cases of influenza, grippe, pneumonia and colds per 100 persons canvassed for the several communities was as follows: San Francisco, Calif., 34.1; Seattle, Wash., 30.9; Kansas City, Mo., 27.1; Farmington, Mo., 37.7; Des Moines, Ia., 47.1; New Orleans, La., 29.6; Cincinnati, O., 27.0; Pittsburgh, Pa., 25.2; Baltimore, Md., 15.1 (exclusive of colds not confining the patient to bed); Syracuse, N. Y., 26.8; Boston, Mass., 23.5. The average of all these localities except Baltimore and Detroit was 29.7.

Nearly 15 per cent of the population canvassed in all localities surveyed in 1929, except Detroit, gave a history of having suffered attacks of influenza or grippe, while 0.47 per cent gave a history of pneumonia. In Detroit the survey indicated that 14.9 per cent of the population canvassed suffered from influenza or grippe and 0.4 per cent had pneumonia.

If results of the survey reflect conditions in the city as a whole as they should—(1) A very insignificant percentage of the actual number of cases of influenza were reported, while approximately 36.3 per cent of the pneumonias were reported. (2) The average loss of time through suffering from one or another of the respiratory conditions was 8.2 days per individual, with an average of 3.6 days spent in bed per patient. Loss of time varied from 3.6 days with colds to 30 days for pneumonia. Days in bed varied from 1.5 in colds to 18 days in pneumonia. (3) Approximately 43 per cent of all patients secured the advice of a physician. Practically all pneumonias were attended by physicians while less than one-fourth of the colds obtained medical advice. In influenza 52 per cent were attended by physicians.—U. S. Public Health Service Release of July 6, 1929, and *City Health,* Detroit Department of Health, June, 1929.

Physical Examination of Indians —Several of the national health agencies, in coöperation with the Oregon health authorities, made possible the establishment of a diagnostic clinic on the Klamath Indian Reservation in Oregon. The examinations indicate that the average Indian of middle 20's is somewhat overweight, married, clean, well dressed, speaks English correctly, lives in a 4-room house, and there is a three to one chance that some member of his family is ill with tuberculosis. His teeth are unclean and decayed, and one out of five has impaired vision due to trachoma.—*Study of the Health of Indians on the Klamath Reservation in Oregon,* National Tuberculosis Assn., Feb. 1, 1929.

LABORATORY

C. C. YOUNG

A PRACTICAL METHOD OF MEASURING SUNSHINE

FRED O. TONNEY, M. D., FELLOW A. P. H. A., AND PAUL P. SOMERS

Bureau of Laboratories and Research, Chicago Department of Health, Chicago, Ill.

AN improved actinic method of testing sunshine for ultra-violet light has recently been developed in the Research Laboratories of the Chicago Department of Health. It depends in principle on the decomposition of oxalic acid, previously studied by Anderson and Robinson.[1]

The detailed technic, which is simple and readily adaptable to field work, is described in a recent issue of the *Journal of Preventive Medicine.*[2] The apparatus is shown in Figure I.

As a result of correlation of the actinic readings of sunshine with the erythema reaction of untanned skin, the actinic reading yields information as to the presence in appreciable amounts of the physiologically important shorter ultra-violet waves, which are cut out by obscuring factors such as smoke, dust, mist and window glass, and which also vary in intensity with the angle of incidence of the sun's rays to the earth's surface. A reading of 3.53 to 3.72 mg. of oxalic acid by the technic used correlates approximately with the minimal erythema dose of sunshine.

By the method described it is possible for those interested in the health value of sunshine to obtain comparative data on the intensity of solar ultra-violet light in any locality—by hours, months and seasons.

In Chicago it was found that there were 7 months of low ultra-violet values in sunshine and that during most of this period the ultra-violet light inten-

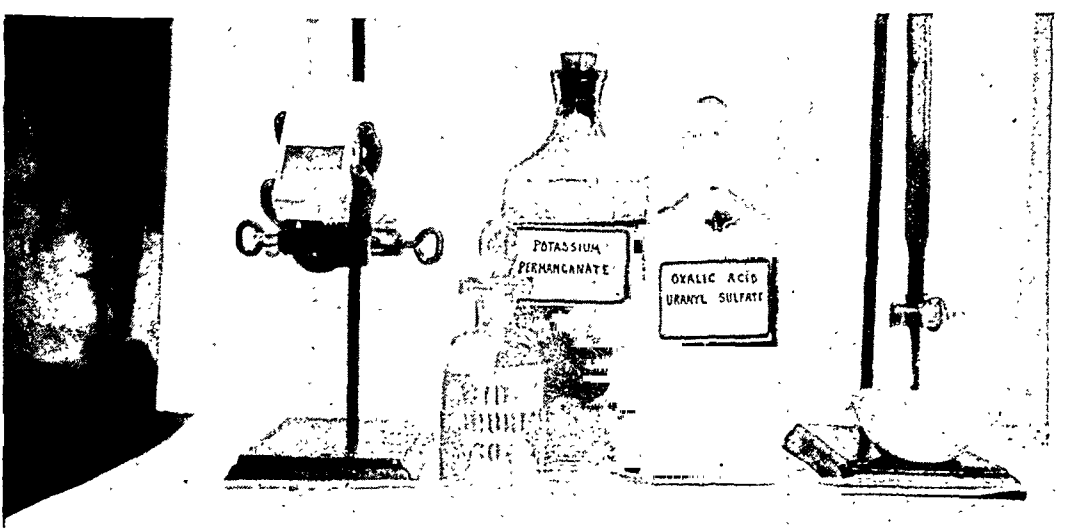


FIGURE I

sity, as judged by the erythema dose, was too low to afford a satisfactory dosage in hourly periods of exposure.

One of the difficulties encountered in the field use of the actinic method in cold weather is the fact that when the solutions freeze even slightly, the sensitiveness of the reagents to light is reduced. During freezing weather, therefore, the readings were heretofore taken indoors through an open window.

Further work on the practical use of the actinic method out-of-doors in freezing weather, indicates that ammonium sulphate can be used to prevent freezing of the solutions without decreasing the sensitiveness of the reagents to light. A 40 per cent solution of the ammonium salt in the actinic reagent prevented freezing down to 4° F. and did not interfere with the reaction. This temperature was the lowest encountered during the experiments and therefore does not represent the lower limit of accuracy of the method. In the titration, a slight correction factor, based on a "blank" control on the actinic-ammonium salt mixture, is desirable in order to check against reduction of the permanganate solution by the unexposed reagents. Salts of sodium could not be used as anti-freezing agents because of their interference with the actinic response. Additional work on this phase of the technic is being done.

REFERENCES

1. Anderson and Robinson, *J. Am. Chem. Soc.*, 47: 718, 1925.
2. Tonney, Somers and Marti, *J. Prev. Med.*, II, 6: 493 (Nov.), 1928.

A METHOD FOR DETERMINING PRESENCE IN MILK OF AGGLUTININS FOR BRUCELLA ABORTUS

A. G. LONG, M. D., FELLOW A. P. H. A.

Director, Laboratory, Maine State Department of Health, Augusta, Me.

PUT about 20 c.c. of herd milk, or milk from individual cows, in clean test tubes of large diameter, and set in the incubator over night. If souring is not complete in the morning or the whey is not clear, add not more than 0.5 c.c. 50 per cent acetic acid to the tube, shake well and filter. The whey for the test should be quite clear or, at most, faintly opalescent. Colostrum is unsuitable.

To set up the test—Use at least 4 ordinary Wassermann tubes for each test. In the front tube place 0.9 c.c. normal salt solution and 0.5 c.c. in each of the other back tubes. Add 0.1 c.c. of whey to the front tube. Mix well. Transfer 0.5 c.c. to the next tube behind. Mix well. Treat the other tubes the same, discarding the final 0.5 c.c.

When dilutions have all been made, add to all tubes 0.5 c.c. of *Brucella abortus* antigen of such concentration that this final dilution gives an opacity equivalent to 1–1,000 (silica standard of the A. P. H. A.).

Tubes are then placed in the water bath at 37° C. for 2 hours, and read the next day after standing at room temperature over night. Positive tubes give heavy precipitates with clear supernatant fluid. On shaking this, precipitate should break into coarse clumps. Unless clumping is present in the first three tubes the reading is reported as negative.

Dilutions are 1–20; 1–40; 1–80; 1–160; etc.

We have found the blood and milk check very satisfactorily.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Insulin and Diabetes—For the first 3 months of 1929 the death rate from diabetes among industrial policy holders of the Metropolitan Life Insurance Company was 23.8 per 100,000, the highest diabetes rate ever recorded for this group. The course of the diabetes death rate among insured males shows that between 45 and 65 years there has been a distinct and significant rise. For females, the only ages showing a decline have been those of childhood and early adult life. From 35 to 45 years of age there has been a slight rise, and after age 55 the female death rate has risen sharply.

A survey of 1,044 fatal cases on which the Metropolitan has paid claims, during the early part of 1929, shows that up to April 15, 63 per cent of the cases received insulin. In a similar survey made in 1924–1925 only 49 per cent of 1,800 cases were given insulin. The percentage of fatal cases treated with insulin was higher in 1929 than in 1925 except in the younger age groups. Between the ages 15 and 44, the percentage of cases treated during 1929 was 84, as compared with 71 in 1924–1925; at ages 45 to 64, 66 per cent as against 52 in the earlier series; and at 65 years and over, 49 per cent in 1929, as against 32 per cent in 1924–1925. At ages under 15, there was no distinct difference between the two series, the percentage treated in each being approximately 70 per cent. The increased use of insulin has resulted in a decline in the incidence of deaths from coma. In 1929 coma was present in 41 per cent of the 1,044 cases. In the earlier series, 48 per cent died in coma. Seventy-three per cent of the coma cases received insulin during 1929, compared with less than 60 per cent in the earlier series. Degenerative conditions such as heart, kidney and circulatory diseases were present in over 60 per cent of the 985 cases in which diabetes was the primary cause of death. Since these diseases occur chiefly after 60 years of age, they form another index of the improvement of diabetes with insulin.—*Stat. Bull.*, Met. Life Ins. Co., 10: 3–6 (May), 1929.

Peptic Ulcer and Cancer of the Stomach—There is a great difference of opinion as to the number of cases of cancer of the stomach due to peptic ulcer. According to several estimates the incidence varies from about 2 per cent to more than 60 per cent. One physician reports that 30 per cent of all ulcers of the pyloric end of the stomach which were resected proved to be undergoing cancerous degeneration. Another states that 26 per cent of gastric ulcers, in all parts of the stomach, were undergoing cancerous degeneration. Three cases were reported in which there were symptoms of gastric peptic ulcer extending over a number of years and which proved to be cancerous. In 1 patient, with symptoms for 12 years, an adenocarcinoma was in the margin of the ulcer. In 2 others, carcinoma was found in the base of the ulcer. In 1 case the clinical symptoms of peptic ulcer had existed for 5 years, and in the other for 30 years.

In 1926, cancer of all organs caused 99,833 deaths in the U. S. Registration Area. There were 35,694 deaths from

cancer of the stomach and liver. Cancer originating in the stomach probably accounts for one-third of all the deaths from cancer in the United States. It can be conservatively estimated that at least one-fifth of the cases of cancer of the stomach arise from peptic ulcer. If removal of so-called precancerous lesions elsewhere in the body is good policy, this should eminently be a proper procedure in ulcers of the stomach that do not respond readily to competent medical treatment.—J. S. Harsley, *J. A. M. A.*, 92: 1813–1816 (June 1), 1929.

The Menace of Appendicitis—For the 5-year periods up to 1920 the appendicitis death rates in England were 50, 62, 69 and 67, respectively, per million population. From 1918 to 1927 both the total number of deaths and death rates showed a continued increase. In 1918 the appendicitis death rate was 65, as compared with rates of 64 for hernia and 81 for intestinal obstruction. In 1927 the appendicitis rate was 70 as compared with 50 for hernia and 65 for intestinal obstruction. A review of deaths from "acute abdomen" at the Leeds General Infirmary, for 1924 and 1925, includes 1,080 cases of acute appendicitis with a death rate of 5.7 per cent. About one-half of these were uncomplicated by abscess or general peritonitis. An analysis of a series of 2,252 cases of appendicitis shows 135 uncomplicated by peritonitis, with no deaths; 913 internal operations, with 3 deaths; and 95 cases with diffuse peritonitis, with 28 deaths. An analysis was made of 2,018 cases occurring over a period of 5 years at London, St. Thomas's and Manchester Royal Hospitals. The average total death rate following immediate operation was 6.7 per cent, rising at St. Thomas's to 8.4 per cent. Among 206 cases of appendicitis operated on at the Great Western Railway Hospital, there were no deaths. Eighteen per cent of the cases required drainage. It becomes increasingly evident that a reduction in mortality will only be effected by greater precision in diagnosis, earlier operation, and standardization of technic.—H. H. Greenwood, *Lancet*, 1: 973–975 (May 11), 1929.

Immunization against Diphtheria—Diphtheria toxoid employed in 3 doses immunized 94 per cent of 100 susceptible persons to the point of a negative Schick test, as compared with 5 doses of toxin-antitoxin which immunized 100 persons to a negative Schick test. The results with both preparations were good, especially since the majority of persons in the series were adults, who are more difficult to immunize than children. The fact that the series given toxoid included children, while those given toxin-antitoxin included no one under 17 years of age, does not account for the difference in results. Exclusive of children, 93.3 per cent in the series given toxoid were completely immunized. In this series no serious reaction occurred with either the toxoid or the toxin-antitoxin. In the series of 100 susceptible persons who were given 3 doses of toxoid and were retested, together with 44 persons who received less than 3 doses and were not retested, 24.3 per cent showed no reaction. A small local reaction was shown after 1 or more doses in 31.9 per cent of the 144 cases; a slight general reaction in 28.5 per cent; and a moderate to severe general reaction in 6.3 per cent. In 5 of the 9 cases in which the more severe reactions occurred, there was a marked "pseudoreaction" in the original Schick test. In 1 other there was a moderate "pseudoreaction"; in 2, a history of a previous attack of diphtheria, and in another there had been repeated exposures to the disease.

Diphtheria toxoid is a better immunizing agent than diphtheria toxin-antitoxin mixtures, even when 5 doses of the latter are given. Diphtheria

toxoid may safely be employed in immunizing adults, and an extra skin test to detect sensitization to the bacterial proteins in the toxoid is not necessary. Care should be taken that the broth employed in producing the toxoid does not contain an excessive amount of protein. —G. J. and G. H. Dick, *J. A. M. A.*, 92: 1901–1903 (June 8), 1929.

Maternal Mortality—Deaths from all puerperal causes in the period 1915 to 1925 numbered 15,876 in New York State. This gave a death rate of 5.9 per 1,000 total births for the period. The average annual rate in 1915–1920, exclusive of 1918 (the year of the influenza epidemic when mortality from puerperal causes was abnormally high), was 5.7 per 1,000 births. The average annual rate in 1921–1925 was also 5.7. In 1921–1925 in the urban part of the state, mortality from puerperal septicemia was 1.3 per cent higher than for the preceding 5 years (exclusive of 1918), and 8.6 per cent higher from other puerperal causes. In rural New York the mortality from puerperal septicemia declined 23.9 and mortality from all other puerperal causes 27.3 per cent.

As a result of a study made in 1925 of 696 maternal deaths in upstate New York, it was found that 74 per cent had received hospital care. Of 230 cases, 13 per cent had entered the hospital before the beginning of labor; 37 per cent entered during labor; and 50 per cent were brought in after delivery. Only 16 cases were reported as having been delivered by a midwife, but 11 others had a midwife in attendance at some time. Sixty-five per cent of 408 cases had prenatal care. It was found that 34 per cent did not have prenatal supervision until the 7th, 8th or 9th month. Puerperal sepsis accounted for 37 per cent of the deaths; albuminuria and the toxemias for 21 per cent; and hemorrhage for 9 per cent. Thirty-eight per cent of the deaths were involved with operative procedures. Hemorrhage was involved in 17.5 per cent of the deaths, 67 being prenatal and 58 postnatal hemorrhages. This study shows the large proportion of maternal deaths caused by septic poisoning and the large number of cases in which operative procedures were involved. It seems that one of the chief causes of excessive maternal deaths is the increasing tendency to interfere with physiological processes. This is more prevalent among city practitioners and in hospital practice than among rural practitioners.—Matthias Nicoll, Jr., *New York State J. Med.*, 29: 800–802 (July 1), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

TYPHOID FEVER OUTBREAK IN FORT WAYNE, IND., DUE TO DUAL VALVE CONNECTION

RUTH C. STURTEVANT

Bacteriologist, Board of Health, Fort Wayne, Ind.

ON February 26, 1929, people living in the vicinity of the Wabash Railroad at Fort Wayne, Ind., complained to the Health Department of dirty water. An inspector was immediately sent to the locality and he reported that the increased turbidity was probably due to the fact that there had been a fire in the neighborhood. This report was corroborated by the head of the water works and the explanation was accepted. A water sample taken there on that date showed *B. coli* in 0.1 c.c. samples. On February 27, several samples of water were taken in that neighborhood, following continued complaints. Physicians were mentioning innumerable cases of dysentery (although none were actually reported), and on March 1 a drastic water sampling and engineering investigation began.

A dual valve was discovered, owned and operated by the Wabash Railroad. This permitted the use of either river water or city water. The valve had been left open, allowing the city mains to become loaded with river water. The valve was immediately closed, photographed, and ordered discontinued. Five days later it was still in place, although we hope not in use, after which it was eliminated.

Gastrointestinal symptoms broke out in another part of the city and it was found that the reservoir had become contaminated with the river water. It was promptly drained and cleaned. By March 8 the water contamination was completely cleared up, as shown by samples taken from places where previously contamination had been demonstrated.

We have no way of knowing the number of cases of gastroenteritis, but there were many. Onset was from 12 to 24 hours after drinking the water and the victims were acutely ill from 3 days to a week with intense diarrhea, vomiting, pain, and extreme weakness. On March 22 the first typhoid fever cases were reported. There were 53 cases and 3 deaths. The last case was reported on May 11. All cases were traceable to the condition of the water.

Despite the fact that in January, 1924, the Indiana State Board of Health adopted and ordered promulgated, effective June 1, 1924, the rule abolishing all such connections, this one had been in constant use since then. In 1923 this same type of valve connection on the Pennsylvania Railroad property caused a similar outbreak with 147 cases and 20 deaths. At this time, a city-wide search was made for other valves and all were ordered out. The search has been resumed during this outbreak and many such valves have been located, although they were not in use. They have been eliminated.

The Process of Aeration in Iron Removal from Water—In general, closed tanks for iron removal are more satisfactory, smaller and cheaper than open tanks, except that, in a closed tank, it is difficult to get rid of the excess of oxygen, which remains absorbed in the water owing to the pressure of the pump. This oxygen corrodes the iron pipes in the distributing system for the water supply, and completely nullifies the effect of the iron removal plant. An apparatus is described, which eliminates this danger, if it is inserted at some point between the reservoir and the pump. It consists of two shafts, with a communicating passage in the lower half of the central wall, into one of which the syphon pipe bringing the supply enters, and out of the second of which the exit pipe leads. The aeration apparatus is built between the two, consisting of three pipes, an injector for water and compressed air, a vertical pipe enclosing the lower half of the injector, and a syphon hood, passing from one shaft to the other. Water containing the necessary compressed air is forced down the injector; it rises up, the vertical pipe mixing thoroughly with the water entering through the syphon pipe, bringing about the separation of the iron. The air and excess oxygen are drawn out of the syphon hood by means of a suction pump. The circulation set up by the compression and suction not only removes the air, but creates an energetic stirring, causing the iron to form a floc, which is easily filtered. Three times the calculated amount of required oxygen is added, i.e., for 100 litres per second with 20 mg. Fe 1 litre per second of air at atmospheric pressure is added. Three plants for iron removal, with this arrangement for aeration, are described, which can be inserted in the supply system. In each, the water is raised 1 to 2 meters above the water surface and let fall through the compressed air injector to the bottom of the removal tank. The water and air rise in the vertical pipe, which is many times wider than the injector. The water is circulated several times in this vertical pipe and the circulation chamber, insuring complete iron removal and development of a good floc. The greater part of the floc settles down into hanging rods or into the rinsing pipe, so that only a small quantity enters the filter.

In one plant described, for inserting near the source of the water supply, the water in the vertical pipe and the circulation chamber circulates about 28 times. Wood-shavings below, and clean, evenly grained gravel above, are used as packing for the filters in these iron removal plants.—A. Vogt, *Tech. Gemeindeblatt*, 32: 6, 1929 (from papers of Water Pollution Research Board, England).

Sterilization of Sea Water by Ozone and Its Use in the Purification of Contaminated Shellfish—Ozone passed through an artificially prepared sea water containing mineral halides had no action on chlorides and bromides but liberated iodine from iodides. It was found that surface sea water (down to a depth of about 100 meters) gave no free iodine upon ozonization, the iodine in the upper strata being in the form of stable organic iodides. Sea water containing heavy suspensions of infectious microörganisms was sterilized in 8 minutes. Sea water ozonized for double the period necessary for sterilization, aerated free from ozone, re-inoculated with microorganisms and incubated for 18 hours gave an abundance of microörganisms, indicating that the water contained no bactericide, and was harmless to shellfish.

Contaminated shellfish in a sterile water undergo progressive self purification, ejecting organisms until the pulp itself becomes sterile. This purification takes several days, varying with condi-

tions. Oysters were immersed for a much longer period than was needed for self purification in changes of sea water ozonized for twice the period necessary for sterilization. These oysters were compared with another batch treated under the same conditions but without ozonization of the water. No difference in appearance, constitution and flavor could be detected. The process can be worked by a rapid sand filtration of sea water, ozonization followed by aeration to eliminate the excess ozone and allowing it to flow continuously over oysters in a trough at a rate of about 100 c.c. per hour per oyster.—H. Violle, *Rev. d'hyg.*, 51: 42, 1929 (from papers of Water Pollution Research Board, England).

Recovery of Tin from the Effluents Derived from the Process of Weighting Silk—In weighting silk, the silk fibers are soaked in a stannic chloride solution, and washed in quantities of water to remove the precipitated tin and the excess chloride. The washing water contains about a third of the tin employed. At present the method employed for recovering the tin is long and costly. The washing water is further diluted to precipitate the greater part of the tin by hydrolysis and neutralized by passing over limestone. The effluent, only partly neutralized, corrodes the channels and pumps and causes the dried oxide to contain impurities, iron and silica which decrease its value. Settlement takes place in a tank, into which the effluent continuously enters, but the sludge is only removed occasionally. The sludge is pumped into a storage tank and then into a filter press, where its water content is reduced.

The filter press is dried later in an oven or drying drum, but the process is long because a skin forms over the oxide, preventing the evaporation of the water. This process is not only long, but 16–75 p.p.m. of tin pass out with the effluent, and more is lost during the pumping process.

Gibson Buttfield of the Vulcan Detinning Company, after a thorough investigation of this process, has invented a new method which is being used with complete success at the works of the Textile Dyeing Company of America, Inc., at Hawthorne, N. J. The washing water, containing tin, is neutralized by an automatically continuous dose of lime-sludge, which precipitates practically all the tin. The coagulated tin-oxide is separated in a Dorr-thickener, continuously pumped into a storage tank and passed on to a spray dryer. Here it dries rapidly and is automatically packed in export casks or sacks. The lime sludge is prepared in a tank with a stirring apparatus. The precipitated oxide is led through a series of resistance plants to remove air bubbles and prevent the floc floating in the thickener.

The spray dryer is made by the Industrial Associates Inc., in New York. This process is very satisfactory, because the loss of tin is only about 4 p.p.m. of effluent, the cost of drying is 50 per cent and the total costs only about third of the old process, and the oxide obtained is cleaner and of a greater value.—*Chem. Ztg.*, 52: 925, 1928 (from papers of Water Pollution Research Board, England).

Disinfection of Swimming Baths in the Tropics with Chlorine and Chloramine—Experiments on the chlorination of the water with chlorine gas, hypochlorite, and chloramine, in two open air swimming pools of the tropics in the municipality of Batavia are cited.

Owing to the strong catalytic action of sunlight in decomposing hypochlorite it was found impossible to keep a fixed minimum residual chlorine in the water of swimming pools with tropical conditions. Disinfection with hypochlorite

could, however, be obtained by distribution at the inlet, at the middle of the tank, and at the outlet; and the adjustment of the amount added, 6 mg. per lit. during the day and 2 mg. per lit. during the night.

The decomposition in sunlight of chloramine was much less, but because of its weaker disinfecting power a sufficiently great minimum quantity of chloramine was needed. In practice, in Batavia good results were obtained with a residual content of 0.4 mg. per lit. of active chlorine as NH_2Cl. Bacteriologically, disinfection with chloramine appeared to give better results.—K. Holwerda, *Mededeelingen Van Den Dienst Der Volksgezondheid in Nederlandsch-Indie,* Vol. 17, 1928, Part II, Foreign Edition, pp. 357–382. Abstr. H. R. Crohurst.

The Effect of Improved Road Surfaces on Public Health—The improvement of public health by hard surfacing of roads has seldom received attention. Some of the factors that assist in this are: (1) Hard surface roads have removed the ever-present dust in dry weather and mud in wet weather which caused injurious effects to both travelers and persons living along the roads. Roads are more easily cleaned and washed, thus removing the collections of liquid and solid animal excreta which were blown into the air with the dust on the former dirt roads; (2) medical men are able to get to their patients more often with less time, and patients may be taken to hospitals with less discomfort in shorter time; (3) food products in fresh condition can be distributed more readily.—W. Lionel Jenkins, *Surveyor,* 74, 1904: 67 (July 20), 1928. Abstr. D. W. Evans.

An Outbreak of Typhoid Fever Traced to Corned Beef Infected by a Carrier—An account of an epidemic of typhoid fever at Wakefield, Mass., a town of about 17,000 population. The place of infection was traced to a church supper, and out of 97 individuals found to have attended the supper, 16 became infected with typhoid fever.

Two tables are given which contain such information as the food eaten by the 15 sick and 49 well individuals for whom this information is available, with the per cent eating each food, the difference in per cent between the number of sick and well individuals who ate each food, and the standard deviation of the differences. The accumulated evidence pointed to corned beef as the mode of infection.

The meat was prepared by 4 women at their respective homes. The only one giving a positive Widal stated that she had had typhoid fever 17 years before. A fecal specimen from this person was positive for *B. typhosus* although her health was excellent at the time of the supper and thereafter. This woman prepared about 20 per cent of the corned beef eaten at the supper, which agrees with the fact that about 15 per cent of the guests became ill.—Clarence L. Scamman and Filip C. Forsbeck, *New England J. Med.,* 199, 14: 664–665 (Oct. 4), 1928. Abstr. F. J. Moss.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Poisoning from Commercial Methyl Chloride—Among the several gaseous substances of more or less toxic nature which recent developments of mechanical methods of refrigeration have brought into usage, are sulphur dioxide, ethyl chloride and methyl chloride. The scientific staff of the Chicago School of Sanitary Instruction has been investigating refrigerant gases for the past 11 months, and intensively for the past 4 months. In the past year there have been reported in Chicago 25 cases of poisoning by commercial methyl chloride gas, with 7 deaths. All except 3 cases (which occurred in a manufacturing plant where methyl chloride refrigerators were made) developed in kitchenette apartments from leaks in the refrigerating system.

The first 4 cases, of which 3 were fatal, occurred in August, 1928. The next 3 cases were first reported as botulism. The next 2 cases, a man and wife, were of less severe type. Then 3 cases were reported in the manufacturing plant above referred to where the illness was characterized by drowsiness and nervous symptoms. Early in June, 1929, 7 cases of uncertain origin were reported in one family and 3 of these died; in the latter part of the same month 3 more cases were reported, with 1 death. Food poisoning was the tentative diagnosis in practically all cases at first; then, later, strychnine, metallic poisoning and mushroom poisoning were suspected in some.

The chief symptoms recorded were drowsiness, mental confusion, stupor, weakness, nausea, pains in the abdomen, and vomiting. In the more severe cases there were convulsions and cyanosis, alternating with coma; later, delirium and restlessness. In some instances the patients were aroused from their stupor by attacks of vomiting. On account of their mental disturbance, several were referred to psychiatrists for diagnosis. Four of the patients complained of blurring of vision and vertigo, which persisted after they had otherwise clinically recovered.

Among the chief physical findings, the pupils in practically all cases were widely dilated and reacted sluggishly to light, while in a few instances a slight squint and unsteadiness of the eyeballs was noted. The pulse, in adults, went as high as 150, and in children reached 165. The respiratory rate in adults reached 32 and in one child was 56. About 36 hours after exposure to methyl chloride, there generally occurred a rise in temperature, reaching as high as 103.5, and in 2 cases just before death it was 107. In nearly all cases there was suppression of urine, which sometimes lasted 48 hours. Urinary specimens tested showed acetone, and formates were found in the 2 specimens for which it was tested (acute stages), while occasional albumin, red and white blood cells were found. Coma in some cases lasted to 72 hours, with recovery. Death in every case was preceded by severe convulsions, tonic in character, and accompanied by a profound cyanosis followed apparently by respiratory paralysis. The blood picture was suggestive of a pernicious anemia ranging from 56 to 85 per cent hemoglobin, with the white count averaging 16,000 on the 3d day.

"The diagnosis is based upon the symptoms and the physical findings

previously noted, together with the presence of formates and acetone in the urine and a history of exposure to the gas." The breath has a musty, sweet odor, and there is an odor of acetone about the patient. A gradual onset of 2 days or more, with drowsiness and mental confusion, is an outstanding syndrome. The spinal fluid was under increased pressure in the 2 cases tested, while the blood pressure was significantly lowered in several of the cases. Examination of the stools failed to show blood in 3 cases.

The poisoning must be differentiated from botulism, poisoning by strychnine, wood alcohol, grain alcohol, and heavy metals, and from sleeping sickness (encephalitis lethargica).

The treatment consists of immediate removal of the patient to a hospital, and giving of alkalies. Oxygen inhalations should be given from the start and continued until the peculiar odor of the breath and body has cleared up. Under no conditions should chloroform or chloral be given. The balance of the treatment is symptomatic.

Upon post-mortem examinations, the surface of the bodies revealed nothing unusual, but muscles and blood were of a dark red color resembling that seen in carbon monoxide poisoning. The lungs showed edema and passive congestion; the kidneys, liver, and spleen—cloudy swelling; the stomach—marked hyperemia and even pinpoint hemorrhages; and the brain—intense hyperemia, with softening, and, in 1 case, a small clot.

Chemical examinations of the tissues failed to show the presence of methyl chloride, carbon monoxide, heavy metals or alkaloidal poisons in any instance. It was not anticipated that methyl chloride would be found because of its low boiling point and rapid oxidation.—*Chicago's Health* (edited by Arnold H. Kegel, Commissioner), 23, 15: 90–95 (dated *April* but issued *July 18*), 1929.

ABSTRACTOR'S COMMENTS: These are additional impressions gained while a member of two Coroner's Juries, the first called by County Coroner, Dr. Herman N. Bundesen, to consider the June 30 death of a young married woman living in an apartment hotel on the North Side (her husband and mother narrowly escaped with their lives), and the second likewise called by Coroner Bundesen to determine the cause of death of a father, mother and small baby which took place July 16 in another apartment hotel on the South Side (not included in the above abstract).

The members of the first jury were: Dr. Morris Fishbein, Editor of the *Journal of the American Medical Association*, Foreman; Dr. H. Gideon Wells, Head of the Department of Pathology at the University of Chicago; Prof. F. C. Koch, Head of the Department of Physiological Chemistry there; Prof. Morris S. Kharasch, Acting Head of Department of Chemistry at the same university; Dr. R. H. Jaffe, Director of the Pathological Institute at Cook County Hospital; and the writer.

In the second jury, Dr. Wells acted as Foreman while Dr. William I. Fishbein, Physician in Charge of the Laboratory School of the University of Chicago, and Dr. Russel M. Wilder, Professor of Medicine at the university, took the places of Dr. Morris Fishbein and Dr. Jaffe of the first jury at the first hearing. At the second and final hearing, Dr. Morris Fishbein again acted in his own stead.

The juries inspected the apartments in both instances. The apartments had a weather exposure only on one side, and the three windows in each case were said to have been found wide open when the first help arrived, although the shades were half drawn in the second mishap. Both apartments were located on the fifth floor and not obstructed by

nearby buildings. There was, however, no cross ventilation. The weather was hot on both occasions. Exposure was 40–48 hours for 2 of the patients and about 24 for the other in the first mishap; but the 3 deaths in the second mishap took place after an exposure of not over 20 hours, and probably between 11 P.M. and 6 A.M.

Both vomitus and fecal matter stained the beds. The air had a sweet, musty odor which seemed more pronounced in the tiny kitchens where the iceboxes were located, although the methyl chloride contents of both boxes had been drained some hours before we arrived. Its presence in the air was still easily detectable by the green-blue flame of the Bunsen burner after the flame had passed through a small piece of copper gauze, and in both instances the flame increased in size and brilliancy when the icebox was approached. In the second mishap several gold fish in two small glass aquariums were alive and apparently unharmed, but the water, upon testing later in Prof. Kharasch's laboratory, showed it had absorbed a large amount of chloride. A mouse was found dead under the dining room table in this apartment.

In both instances some 50–100 icebox units in as many apartments had been hooked up to one methyl chloride storage tank located in the basement in which a pressure of about 100 lb. was maintained by an automatic pump, so that a leak in one unit might drain practically the whole system. The defrosting was left to the janitors, and was attended to about every 10 days. While all units and connections were claimed to have been tested repeatedly under high pressures before occupancy of apartments, it was suggested that if de-frosting were not frequent enough, coats of ice thickening on the coils in an icebox might spring the coils until a leak occurred, or a joint might leak. Service men testified that the only test they made for leaks was with lather made from shaving soap and applied with a brush, but admitted that they could not reach all parts of coils, etc., with same. It was stated also that some of the unions between the coil units and supply pipes in the iceboxes had proved defective.

While icebox manufacturers had had mishaps in which large quantities of the gas had occasionally escaped, and workmen had suffered and sometimes had been off for as long as 2 weeks, nothing serious had happened and it was not thought domestic exposures would ever approach these in magnitude. No previous research upon the matter had, however, been made, and most thought that small amounts even over a prolonged period were harmless.

Testimony showed that a similar mishap had occurred in the North Side apartment hotel on the first floor some 6 weeks previously, in which the husband had been found unconscious, taken to a hospital, and later removed to the county psychopathic hospital for restraint and care, for several days. Service men of the company concerned had examined the icebox at that time and pronounced it intact.

Dr. Ralph W. Webster, toxicologist for the county, testified that he found methyl chloride in the food left in the icebox in the first mishap, and found formaldehyde and formates in the organs of the woman who had died, and that two guinea pigs left in the apartment likewise showed formaldehyde and formates in their tissues; also that two other guinea pigs had died after an exposure of about 30–40 hours. Examination of the organs of the 3 victims in the second mishap showed methyl alcohol, formaldehyde, and formates, while the blood showed an excess of chlorides.

The *Journal of the American Medical Association,* July 27, 1929, page 312, published a list of 35 trade names of mechanical refrigerators and refriger-

ants used, so far as is now known; of these, 8 were using methyl chloride. In the July, 1929, issue of this JOURNAL, page 825, we called attention to *Public Health Bulletin 185,* which discusses experimental toxicity of methyl chloride and related substances. A comprehensive article with case reports by Kegel, McNally, and Pope is contained in the August 3, 1929, issue of the *J. A. M. A.,* pages 353–358.

It is probable that following the reported banning of the use of methyl chloride in iceboxes in Chicago by the Health Commissioner, something will be found to add to it in the way of an odor and an irritant to render its presence noticeable in the case of leaks. It was said there were 75,000 installations of methyl chloride iceboxes in Chicago alone; also that manufacturers were especially interested in stopping leaks of the substance because it was an expensive chemical. The prospects also seem to indicate that a non-toxic refrigerant has now been discovered.

Sequelae are occurring in some of the more severe cases, such as unsteadiness of gait, tremor, visual disturbances, weakness, insomnia and lapses of memory.—EMERY R. HAYHURST.

Progress in Metal Mine Ventilation—The recent occurrence of a number of deaths from heat stroke in the deep gold mines of South Africa, in a practically saturated atmosphere with temperatures between 85° and 91° F., calls attention to the fact that such temperature and humidity conditions are to be found in a considerable number of deep metal mines of the United States. While in Australia ice has been used for cooling mine air, the most effective remedy is the continual circulation of large volumes of fresh pure air from the surface. This also greatly dilutes the dustiness because of which there is now much silicosis as well as kindred diseases. Most certainly other dusts than silica are harmful, as has recently been pointed out by the U. S. Public Health Service in the investigation of the dust associated with cement working.

Metal mines are likewise subject to fires, and occasionally there have been carbon monoxide mishaps due to the burning of a small amount of combustible matter such as the debris from boxes, sawdust, etc.—D. Harrington, *Information Circular 6136,* U. S. Bureau of Mines, Washington, D. C., 1929.

Bureau of Industrial Hygiene in the Michigan Department of Health—The bureau was officially established April 1, 1929. A survey has already been made of a number of industrial health departments in the state and others will be made. A number of definite objectives have been formulated for the work of the Division and a physician who has had considerable experience with the department as well as in industrial medical work has been placed in charge of the bureau. Thus far, about 100 establishments have been surveyed ranging from 150 to 30,000 employees.—*Bull. Am. Ass. Indust. Phys. & Surg.,* III, 3: 3–5 (June), 1929.

International Conference on Silicosis—The Chamber of Mines of Transvaal, South Africa, has donated 2,000 pounds to the International Labor Office for defraying the expenses of an international conference of experts on silicosis, at Johannesburg in 1930.

Experts from Great Britain, the United States, Canada, Germany, Australia, and South Africa will discuss medical aspects of silicosis with especial reference to its control and prevention in mines.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Permissible Content of Arsenic in Food—This article includes observations made by the author as a result of a resolution of the association of canton and city chemists held in Geneva, June 7, 1929. The permissible limits for arsenic in food are considered: first, those additions which are intentional and, second, those which are unintentional. The first is subdivided into two headings: the intentional addition of arsenic to food, and the natural or accidental contamination of food with arsenic.

The association was unanimous in declining to recognize the deliberate addition of arsenic to food. Arsenic can always be determined in plant and animal organs. Sea water as well as water from springs or streams contains arsenic; it is in the soil, even in primeval rock (0.06 mg. per 100 gm. in granite, 0.4 to 1.3 mg. in marl, and 0.25 to 0.5 mg. in virgin soil of the United States). The highest amount actually occurring in plants is in wild oats and beets—0.062 mg., 0.061 mg.—and in tobacco 1.02 mg. per 100 gm. of dry substance. This arsenic is absorbed through the roots, experiments showing that arsenic spray on the leaves of the *Beta vulgaris* is not absorbed through the leaves. These amounts are not dangerous and need give no concern unless it should eventually be found that such minute amounts play a rôle similar to the vitamins in nutrition.

With the unintentional, especially undesirable additions of arsenic occur higher figures, (1) through the use of fertilizers, (2) through spraying (arsenic distributed in the ground may be absorbed by the roots and contaminate vegetables planted therein), (3) especially through the spraying of fruit itself. Under (1) and (3) the arsenic is absorbed in the plant and cannot be removed; under (2) there is a possibility of reducing the arsenic content by (a) limiting spraying to only immediately after blossoming, (b) more or less by rainfall, (c) by dipping the fruit 5 minutes in 0.3 to 0.5 per cent hydrochloric acid followed by a water rinse and (d) with fresh apples and pears by peeling (in fruits such as plums, prunes, berries, dried fruits, and preserves, the latter is not feasible).

Arsenic is detected in the skin, hair, feathers, bones, and internal organs of animals, and it is pointed out that while the maximum dose is from 5 to 15 mg. a noticeable effect follows the administering of 0.10 mg. There is a discussion as to the effect of arsenic on the organism. Pentavalent arsenic is nontoxic but easily reduced to the trivalent toxic form. Idiosyncrasy toward arsenic is not unusual and for that reason significant.

Comparison is made between arsenic in small and large doses; the former prevents oxidation although it accelerates growth and effects an interchange of metabolic process and apparently increases the formation of red blood corpuscles. A large dose is followed by loss of weight and increased decomposition of the elementary tissues, corresponding interference with the organic functions, breaking down of red corpuscles and fatty degeneration of organs. Owing to individual idiosyncrasies and variation in resistance it is

difficult to draw a line between large and small doses.

The chronic effect of arsenic is significant, especially on those organs most in demand for life processes, the kidneys, liver, capillaries and blood. Various amounts of arsenic are recorded in food, from undetectable amounts to as much as 1.854 mg. on one apple.

The author is compelled to register objection to the introduction in commerce of heavily sprayed fruit and is led to believe that the limit of arsenic permitted in England on apples—1.43 mg. per kg.—is entirely too high. In view of the fact that arsenic in small doses in foods shows definite and undesirable effects, that idiosyncrasy toward it is not unusual and on account of the continually increasing fad for raw food the following proposal is made:

That the highest permissible content of arsenic in food and food substances should not exceed 0.1 mg. of arsenic per kg. Exception is made for certain arsenic bearing natural mineral waters on the ground that they are dispensed as medicines and not as articles of food. —Prof. Dr. E. Waser, *Mitt. Leben. und Hyg.*, Band 20, Heft 3, p. 147, 1929.

The Loss of Iodine and Other Mineral Substances in Spinach, Resulting from the Customary Culinary Preparations—In this experiment the customary culinary operations were followed, in that tap water and added salt were used in place of distilled water as was the case with previous investigators. Summer spinach was washed free from sand and dried at 60° F. and ground in a mortar to a uniform powder. This was analyzed and the results are given. Picked and washed spinach was added in small portions to boiling tap water containing common salt. As the water continued to boil, the spinach was kept under the surface. After cooking, the water was removed, the spinach washed, and the liquids dried at 100° F. The residue was analyzed and compared with the mineral content of the original material. The greatest loss in basic substances was in the case of potassium, and the least in the case of sodium, the total loss of mineral salts being 44 per cent.

Due to the opinion that the basic element in the ash of foods is valuable in correcting acidity, comparison was made between the loss of basic and acid radicles in the cooked spinach. It is found that the loss in bases in the cooked spinach was 10.15 mg. per 100 gm.; of acids 4.13, but there is still in the cooked spinach considerable excess of bases. Separate determinations were made for the loss in iodine in cooking which were found to be 3.5 gamma (gamma — 0.001) for 100 gm. of fresh spinach. The loss is less than one-tenth of the original iodine content, the conclusion being that it is present in organic combination and not in the form of easily soluble salts.—A. Meiermeister, *Ztschr. f. Unter. der Lebensmittel,* Heft 2/3, Feb.–Mar., 1929, p. 235.

The Effect of Drying and of Sulphur Dioxide upon the Antiscorbutic Property of Fruits—Only one experiment in the literature on commercial dried fruit was found which, with the varying results reported on the canning and preparation of fruit, led to the work here reported. The fruit used was ripe peaches grown in California. The fruit was cut, pitted, ground, packed in small tin containers and kept in a freezing room at 17° F. Other portions were sun-dried (sulphured and unsulphured) and dehydrated (sulphured and unsulphured), sulphur dioxide being employed in the ratio of 1,840 to 1,875 parts per million. A scorbutic basal diet of rolled oats, skim milk powder, sodium chloride and cod liver oil was used. The animals (young guinea pigs) succumbed to scurvy on this diet in 25 to 35 days.

Five various modifications of fruit were given in separate test doses and all of the results are tabulated for the feeding periods, which varied from 32 to 90 days. All animals on unsulphured fruit, either sun-dried or dehydrated, succumbed early, in a manner similar to those on the basal diet alone. Animals on the sulphured fruit, both sun-dried and dehydrated, were practically free from scurvy for the 90-day period. The question was raised as to whether the protective action was due to decreased oxidation due to coagulation, or because of the reducing action of sulphur dioxide, or to greater stability of the vitamin in the more acid medium. Comment is made on the result of this investigation with the question as to the deleterious effect of sulphur dioxide on human health. Since arbitrary limits for sulphur dioxide in fruit have been placed by certain foreign countries and one or two states in this country it seems desirable to know at what sulphur dioxide content the protective action on vitamin C is effective. The antiscorbutic power of sulphured dried peaches is high, 1 gm. of the product being equivalent to 1.5 to 3 gm. of oranges or lemon juice, or fresh tomato, and to 3 times that quantity of banana, 6 times the amount of raw apple or pear or cooked potato. Similar experiments are being conducted on prunes and apricots and the effect of lye-dipping on vitamin C content is also being investigated.—Agnes Fay Morgan and Anna Field, *J. Biol. Chem.*, 82: 579 (June), 1929.

The South Carolina Food Research Commission—The South Carolina Food Research Commission was authorized in 1928 by the session of the South Carolina legislature to conduct studies on the iodine content of vegetables grown in that state. Tables are given showing the content of these vegetables compared with those grown in other states, which run from 98 p.p.b. in sweet potatoes to 754 in lettuce, in the dried vegetable. It has been suggested that the high iodine content of South Carolina vegetables is due to Chilean sodium nitrate. The authors point out that this nitrate contains very small amounts of iodine and the section of the state showing the highest goiter incidence and the lowest iodine in vegetables was the site of the largest use of Chilean nitrate. In a study of the effect of diet in goiter cases now under way, only 4 out of 27 cases so far investigated included vegetables in the diet.—William Weston and Roe E. Remington, *J. A. M. A.*, 92: 2161 (June 29), 1929.

The Respiration Factor in the Deterioration of Fresh Vegetables at Room Temperature—The rate of respiration was the index used to determine the degree of deterioration in fresh vegetables as handled for market, previous work having shown marked changes in green sweet corn and asparagus. A description is given of the respiration apparatus. The experimental material was fresh vegetables of edible maturity brought directly from the garden into the laboratory without wilting. The varieties used were beets, green onions, carrots, lettuce, green beans, pimentos, mangoes, okra, tomatoes and asparagus. The material collected was at a temperature of 30° C. and this was maintained as a working temperature. Determinations of respiration losses were made at intervals for a period of 30 hours. Curves are given showing the amount of CO_2 evolved per 100 gm. dry weight per hour. The total weight of carbon dioxide evolved was determined and by calculation the amount of glucose lost between the 2d and 26th hours. The vegetables, according to the amount of gas evolved for equal weights of dry matter, range in the following descending order: asparagus, lettuce, green bean, okra, green onion, carrot, tomato,

beet, green mango, red pimento. The corresponding amounts of glucose vary from 13.68 gm. per 100 gm. for asparagus to 1.29 gm. for pimentos.—Marjorie P. Benoy, *J. Agri. Res.*, 39: 75 (July 1), 1929.

Iodine Survey of Nebraska—Nebraska is not included in the goiter area of the United States, indicating appreciable amounts of iodine in the soil or water. To confirm this, samples of drinking water, soil and food materials were secured and analyzed. The soil samples indicated amounts from 0 to 15 p.p.b. and the water samples from 8.8 (at Lincoln) to 30 p.p.b. (at Peru). A table is given showing the iodine content of various foods grown in the state which varies in p.p.b. from 62 in cabbage to 220 in carrots. Corn, wheat and onions showed no iodine content. The water analysis did indicate that there is sufficient iodine except in the extreme northern part of the state where less than 5 p.p.b. of iodine are found. While the soil analysis indicates deficiency in iodine, it is believed that some of this was in soluble form and has been leached out by rain and surface water. Food materials are not regarded as low in iodine, comparing very favorably with figures reported for nongoitrous regions.—W. H. Adolph and F. J. Prochaska, *J. A. M. A.*, 92: 2149 (June 29), 1929.

Composition of Bone. VI. Effect of Massive Doses of Irradiated Ergosterol—This work records the analyses of a number of bones which were obtained from autopsied rats in experiments with massive doses of irradiated ergosterol. One group of rats was fed 2 gm. of cod liver oil to every 100 gm. of the ration, and another group was the control. The serum calcium of the control rats was 10.9 mg. per cent, that of the cod liver oil group was 13.9 mg. per cent, and that of the ergosterol group was 16.1 mg. per cent. The mean of all ratios of residual calcium of bone was found to be 2.00 compared to 1.99 for normal rat bones. Control ratios were 2.09 and 2.02, the ergosterol group 2.03, 2.00, and 2.04, and the cod liver oil group 1.91 and 1.93. Figures for the ratio in all of the bones of all of the groups closely approached the mean. —Benjamin Kramer, M. J. Shear, and Margaret R. McKenzie, *J. Biol. Chem.*, 82: 555 (June), 1929.

The Sanitary Significance of Leucocytes in Milk—It is difficult to understand the true significance of variable numbers of leucocytes and other types of cellular materials in milk without an understanding of the reason for their presence. The fat laden gland cells and gland cell nucleuses present in limited numbers in normal milk represent wastage from the active gland and have no sanitary significance. Leucocytes even in fairly large numbers, i.e., millions per c.c., may be present in milk that is normal so far as is evident from ordinary chemical or bacteriological examination. On the other hand, excessive numbers of leucocytes are usually associated with some abnormal condition, particularly mastitis. The usual form of mastitis is one caused by an infection with streptococci and these bacteria are usually evident among or in the leucocytes when the milk has come from a cow suffering from an inflamed udder. Pathogenic streptococci are sometimes difficult to distinguish microscopically from saprophytic streptococci. Other bacterial infections of the udder may also cause increased numbers of leucocytes to appear in milk.—Robert S. Breed, N. Y. State Agri. Exper. Sta. *Bull. No. 568* (Apr.), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

Maternal and Infant Mortality and Morbidity—Indications multiply that all over the world a concerted effort is being made to do something about that most outstanding problem of public health, the maternal and infant mortality rate. To do anything of importance about it, we must do two things: (1) learn more about the factors involved; and (2) get to the public the information we already possess.

There are many pitfalls, however, in getting such information to the public. It is too easy to become merely a propagandist and to give to the public as facts things which we wish were facts or hope are facts. There seems to be a great fear of acknowledging the limitations of our knowledge. And then there is the great delusion that all that is necessary to reduce the maternal mortality is to spend money.

It will be interesting to see what will be produced in the course of the campaigns referred to below, by two English speaking countries somewhat more given to conservative statement than we ourselves are. Both of the extracts to follow are from the *Child-Welfare News Summary*. The first is based on an article in *National Health*, London, June, 1929, p. 411:

> Under the auspices of the National Association for the Prevention of Infant Mortality a joint committee has come into existence for the purpose of enlightening the public on the subject of maternal mortality and morbidity in childbirth. The committee now includes representatives of 11 prominent organizations especially interested in the subject, and others have been invited to cooperate. All organizations of women, both national and local, whether technically interested or not, will be asked to assist. The committee plans to conduct a nation-wide campaign and has undertaken to prepare a panel of speakers for public meetings and supply them with up-to-date statistical material.

The second reference comes from our neighbor, Canada, whose problems are in many ways so similar to ours, and appeared in the *Canadian Child Welfare News*, Ottawa, May 15, 1929, p. 42:

> The Canadian Council on Child Welfare has announced that through the interest of the Canadian Life Insurance Officers' Association it will be enabled to undertake a 3-year intensive educational campaign in the field of maternal and infant welfare. The council has been carrying on considerable educational work in coöperation with the public health departments of the provinces in the distribution of simple prenatal letters and diet folders and other material on nutrition. The organization now plans to issue prenatal and postnatal literature, and malnutrition and diet folders, published in both English and French, which will be prepared and reviewed by competent authorities before release. A special feature of its work will be the preparation of health exhibit material, which will be available to other organizations, to conferences, and especially to women's conventions, fairs, and summer picnics in the smaller towns and cities and in the rural areas. The work will be directed by a committee of the child hygiene section of the council, which will include representative public health workers from different parts of the Dominion.

Baby Health Stations and Family Budgets—It is generally believed by young and inexperienced health officers that, given a large enough budget, they can forthwith banish disease from the world. It is sometimes believed by young social workers that bigger and busier clinics and more of them constitute the panacea for most of life's ills. Enlightenment—or disillusionment—often follows an open-minded study of the question. But open-minded studies

are not so common as they might be. However, the one reported by Margaret H. Lyman for the New York Tuberculosis and Health Association in *The Modern Hospital,* June, 1929, seems to be in that class.

The investigation in question studied the economic status of those making use of the 13 baby stations in the Bronx. Fifteen per cent of each station's registration during September and October, 1928, chosen at random, formed the basis of the study. Seven hundred and twenty-two families were visited in their homes and the usual social data obtained for the purpose of determining financial status.

The results showed that in 87 per cent of 501 families the father made his living at a trade or in a factory. Eighty-five per cent lived in 4 rooms or less. The families, in the majority of cases, consisted of 3 to 5 persons. More than one-fourth were considered to be living under unhealthful conditions.

Only 21 per cent of the families were considered to have incomes adequate to meet a standard of comfortable living. The investigators here show great self-restraint in that they do not commit themselves as to whether this 21 per cent should be expected to pay for service such as they went to the clinic for. They advise further study of the question.

It is greatly to be hoped that this further study may be forthcoming, and that someone will study with equal care those attending the many well child, dental, eye and other clinics in smaller places, often carried on at public expense.

Dental Hygiene in Massachusetts—The June issue of the *Commonhealth* (the quarterly bulletin of the Massachusetts Department of Public Health) contains an interesting statement on 10 years' progress in dental hygiene, and a more detailed report of the work carried on by that department during 1928. Dental work, especially on the part of municipalities, has grown rapidly of recent years in various states and this growth has not everywhere been a healthy one from a social point of view. In too many instances municipal or state departments of health have conducted dental clinics with little or no appreciation of the principle of family responsibility for medical care.

In 1919, states the article, Massachusetts inaugurated a dental advisory and informational service, in charge first of a dentist and later of a dental hygienist. At that time 43 communities in the state had a definite school dental program; at present the number is 223 (out of a possible 355). The number of school dentists has grown during this period from approximately 50 to 250. In 1919, there was only one dental hygienist in public health work in the state; at present there are 50 doing school work in the various communities.

Turning now to the report of the Consultant in Dental Hygiene for the year 1928, we get a more detailed picture of the way one state handles its dental hygiene problems. Work is carried on under a fixed policy which has the approval of representative state dental organizations. An advisory committee aids the consultant in matters of policy and regional consultants nominated by the president of the state dental society aid in local problems and situations. On the part of the local workers themselves, interest is evidenced by the formation early in the year of the Association of School Dental Workers, with a membership of 345.

A realization of the need of better training for school workers in dental hygiene resulted in a course for dental hygienists in school dental procedures being given at one of the state summer schools.

A general informational service, which

includes pamphlets, delineascope films, etc., is of course offered. It is interesting to note that the lecture service is being curtailed to give more time, it may be inferred, for work that is less of a shot in the dark.

One great danger of any dental program is that it may be confined to the group which makes use of the dental clinic. To obviate this, a campaign was started as part of the May Day-Child Health Day program which had as its object the interesting of every child and his parents in a clean mouth. A system of dental certificates was made use of, with rewards for child and schoolroom meeting the requirements laid down to insure clean mouths. This scheme had the merit of bringing the family dentist as well as the clinic into the picture.

On the whole, these two reports show what can be accomplished in the way of leadership when a state consultant in dental hygiene keeps his (or her, as in this case) feet on the ground, avoiding the insidious pitfalls of state clinics and other manifestations of so-called state medicine. Furthermore an advisory rather than a supervisory relationship seems best adapted to foster a strong local sense of responsibility.

Health of the Child in Industry—In spite of present-day interest in the health of the school child, most communities have strangely overlooked their responsibilities to that child who is partly in and partly outside the public school system; that is, to the child in industry who attends the continuation school. In an article reprinted from the *American Child*, Rowell discusses Preserving and Promoting the Health of Working Children, and starts off with the reasonable proposition: "Protection and promotion of health is just as desirable in continuation schools as in (the ordinary) public schools." Many children will or must go to work; how can we minimize or prevent entirely injury to their health?

The continuation school child is at a crucial period of his physical and mental life. He is growing rapidly and should be under strict supervision. It is often for his best interests that he be forbidden to go to work; at least, if he is allowed in industry he should be safeguarded against avoidable hazards.

Theoretically, it is pointed out, the health program of the continuation school should consist, as in the regular school, of health service, physical education and health education. As a matter of practice, however, there are difficulties in the way of this, due in part to the brief period each week that such children are in school.

Several interesting points are raised by Rowell with regard to present practices for handling health certification. Why is not use generally made of the cumulative health records supposedly available in the hands of the school authorities? Again, why should not the child be charged a small fee for the physical examination at the certificating office, the proceeds to be used to improve the health service?

A suggestion is made that in the case of certain adolescents a test may be made of their ability to do well under conditions in industry, by allowing them to work for a few weeks and then checking up on their reactions. Follow-up work by directing a child toward remedial measures may render him eligible to work.

The author, further, discusses the type of physical education desirable for those in the continuation school, based on the type of work the individual is engaged in. The requirements of the clerical worker are not necessarily those of the shop worker. Health instruction is dealt with at some length. The difficulties here are of various kinds, such as the wide spread of mentality of the pupils and the usual lack of health

background of the continuation school teacher. Methods of approach to different classes of pupils are discussed.

Emphasis is laid on the necessity for: (1) a health education specialist in all continuation schools; (2) more research; (3) a well planned program based considerably on local needs.—Hugh Grant Rowell, M.D., Preserving and Promoting the Health of Working Children, *Pub. No. 352*, National Child Labor Committee.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

THE INTERNATIONAL COUNCIL OF NURSES' CONGRESS IN MONTREAL

All attendance records for congresses of the International Council of Nurses were beaten when 8,000 nurses from all quarters of the globe met in Montreal July 8–13.

The countries whose national nursing associations are affiliated with the International Council of Nurses are Great Britain, United States, Germany, Canada, Denmark, Finland, Holland, India, New Zealand, Belgium, China, Italy, Norway, South Africa, Bulgaria, Cuba, France, Irish Free State, and Poland. The Nursing Associations of Brazil, Greece, Jugo-Slavia, the Philippines, and Sweden became affiliated with the I. C. N. in a very touching ceremony at this meeting. Nurse delegates were sent from all these countries to Montreal; in some cases their expenses were paid by their governments.

Other countries sending nurse representatives to the meeting were Czechoslovakia, Esthonia, Iceland, Japan, Korea, Latvia, Switzerland, Turkey, Hungary, Palestine, Spain, Syria and Uruguay.

The three countries affiliated with the International Council of Nurses having the largest memberships in their national nursing associations are the United States with 75,000 members, Great Britain with 33,845 members and Canada with 10,216 members.

One might wonder what so many nurses, from so many countries with languages, customs, races and traditions so different, could have in common in a professional way. But for one who had never before attended an I. C. N. convention the similarity of aims and ideals of the forward looking nurses in all the countries was striking. All were bending their efforts to raise the educational standards and improve the social status of the nursing profession. And Nina Gage, R.N., of New York, President of the I. C. N., in her address on the opening night, spoke the key words of all the proceedings at the Congress when she said: "Through all our problems runs the scarlet thread of our ultimate object, better care of patients, whether in home or hospital, ill or prevented from becoming ill."

Mlle. L. Chaptal, Directress of the "Rue Vercingetorix" School of Nursing in Paris and President of the National Association of Trained Nurses of France, is the new President of the International Council of Nurses.

The next Congress will be held in Brussels and Paris in 1933.

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

The Place of Health Exhibits at County Fairs—People go to county fairs more for the purpose of seeing things than to have things done. They see prize products from over the county on exhibit; conceive new ideas about different degrees of perfection; and go home determined to attain a new perfection in the various phases of farm life.

It seems logical then that a health exhibit at the fair is the thing most needed to make people go home and do the things that will promote personal and community health. Experience in Texas has shown that health conferences cannot be successfully conducted at county fairs.

Public health nurses in Texas are asked to arrange exhibits at their fairs and have pictures taken of these exhibits to send to the Texas State Board of Health, with a description of the apparent effectiveness of the exhibits. These will be discussed at the next staff conference of public health nurses and all will gain new ideas and suggestions for next year's fair work.—H. W. Barnett, News Items from the Texas Field of Public Health Nursing, *The Gleaner,* June, 1929.

The Public Health Nurse and the County Doctors—If a nurse must choose between having a large number of children receive toxin-antitoxin administered by state workers at cost, and a smaller number receive it administered by the family physician at an increased cost, she should choose the second alternative because in the long run it is better to keep the confidence and favor of the doctors which she needs to carry on her whole health program in the community.

If the public health nurse advises patients to attend the free tuberculosis, dental or baby clinics put on by the state, without due regard to the rights of the family physician, friction will ensue. So it is better that patients should be referred to the clinics by the family physician, and any treatment advised should come from him.

A public health nurse should be wary about accepting a patient's word that his financial condition will not permit him to pay for medical treatment, unless she is otherwise very sure of it. In case of doubt it is always well to consult his physician if he has one. There are families, however, who have not the means for necessary medical attention, and here again the family physician, if there is one, should be given the chance to treat the family free, or at a nominal charge if he cares to, or suggest sending the patient somewhere else.—Nancy W. Rand, R.N., The Public Health Nurse and the County Doctors, *The Echo*—Virginia State Health Dept., IV: 150 (June), 1929.

If there is no family physician or if he is not available, every effort should surely be made to conserve the best interests of the patient.

Health Day at a Teachers' Institute—In Indiana the superintendent of schools in each county arranges a 3-day institute for all teachers in the county schools. These institutes are generally held the week before school begins in the fall. The public health nurse usually has to be content with from 15 minutes to an hour of the program time to explain her health plans for the coming year to the teachers, and she always has an exhibit of health material at the meeting.

This year the school nurse in Randolph County prevailed upon the County Superintendent of Schools to allow her to have one whole day of the institute for a health program. She has arranged to give a demonstration of a teacher's morning inspection of pupils, and following this there will be a discussion of the teacher's part in the health program. Then she has ar-

ranged to have a man prominent in this particular field speak for an hour on the subject "The Subnormal Child." In the afternoon there will be a lecture on Health Education by a teacher from a neighboring state who has done outstanding work in this line, and for the last thing on the program the State Health Commissioner will address the teachers on "The Modern Control of Communicable Disease." There will be plenty of time for questions and discussions after each address.

A novel feature of the meeting will be a session for school janitors and the State Health Commissioner will address them on School Sanitation. This county has eighteen consolidated schools and no one room rural schools, so that every school has a janitor, and each janitor has promised to come to the meeting.

School Nursing as a Career—The old idea of school nursing emphasized the negative aspects of the health program, and consisted mainly of detecting cases of contagion and physical defects and making home visits to try to persuade the parents to secure corrections.

The modern school health problem is a positive thing—it tries to develop fine children and reaches every child in school. Now, however, the school nurse is only one participant in a big school health program, and the effectiveness of her contribution depends on the willing coöperation she receives from the teaching staff in the school and her coworkers in the community.

The school nurse acts as the representative of the commissioner of health in her school contacts, and in matters that concern health should be the consultant and adviser of the superintendent of schools.

The first personal qualification a school nurse should have is good health, both mental and physical, and this should mean that she has a good store of energy and is good natured. She must also have a genuine love of people.

On the professional side she should be a high school graduate, and have her nurse's training in a hospital nursing school of high standing. On top of this, a generalized training in public health nursing, as postgraduate work, is necessary. In her public health course she should have plenty of opportunity to study normal children to enable her to handle better the usual childhood problems.

Skill in newspaper and general publicity methods will be of great value to the nurse in interpreting the needs of child health in the community. Teacher training and experience are extremely valuable to her as she is always a teacher herself and this training helps her to appreciate the teacher's problems in the classroom.

There is great need of school nurses with good educational background to do research work in the correlating of regular school subjects with the school health program.

The following are some problems in school health work where a school nurse's research work would make valuable contributions to both modern educational and preventive health methods:

1. Causes of absences of school children
2. How best to control contagious disease
3. Effect of extra nourishment on underweight children
4. Progress of individual children who present peculiar difficulties
5. Comparison of health of children who live in coöperative and incoöperative homes

A school nurse who sees her opportunities can be an unlimited influence for good in a community and especially in the lives of its boys and girls.—Elma Rood, School Nursing as a Career, *J. Nat. Ed. Assn.*, 18, 5: 147 (May), 1929.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Meet the Editor at Minneapolis—What was best in your publicity last year? In what did you fail or have but moderate success? What experiments have you made? What tests? What new methods, or old methods tried in a new way? What questions do you want answered?

The editor of this department and associates in the Public Health Education Section will be at Education-Publicity Headquarters most of the time between section meetings. Join the group—to give to others, to glean for yourself. Consultations with specialists will be arranged for all who wish them.

What Will You Send to Minneapolis?—Will you send leaflets, folders, booklets, posters? Educational or money-raising letters? Posters, placards, car cards? Copies of radio talks? Topics for health speakers? Slogans or titles? News stories or news photographs? Lists of publications available? Lists of pictures or exhibits? Campaign scrap books?

What have you? A single piece of printed matter, or a varied collection of publicity material? *Please write quickly for instructions,* addressing the chairman of Headquarters and Exhibit Committee, Evart G. Routzahn, 130 East 22d Street, New York, N. Y.

Matter for free distribution should be addressed:

Free Distribution
Education-Publicity Headquarters
Minneapolis Auditorium
Minneapolis, Minn.

But please write in advance if you expect to send anything for the classified display at headquarters.

If They Do or If They Don't—In any case the A. P. H. A. meeting in Minneapolis is an opportunity of significance.

If staff workers know all about their jobs in publicity or health education, Minneapolis will be an opportunity to share with others.

If staff members lack knowledge or experience, a few days at Minneapolis will be the best possible investment of department or association funds.

Those who handle motion pictures or send out exhibits, those who get up printed matter or distribute it, those who deal with newspapers, and those who work with the schools—all will find much at Minneapolis that they can use in "their business."

What Shall Be Told?—How much should the public be told about vitamins? What is it reasonable to say about brushing the teeth? What exaggerations and mis-information on health topics are found in current advertising and health publicity?

You are invited to submit material, either your own—for approval, of course—or some from another source of which you disapprove, to the clinic on "What to Tell." Much attention has been given in past meetings to ways and means of making health information interesting, clear and convincing. At one meeting of the Public Health Education Section in Minneapolis the intention is to go behind the form of presentation and discuss the subject

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

matter—what facts need greater emphasis, what statements, although essentially true, are misleading; in other words, what the public should and should not be told in 1929. Please send good and bad examples to the editor of this department as soon as possible.

Study Exhibits in Action—The popular health exhibition, which will be held in the main auditorium as a feature of the A. P. H. A. meeting at Minneapolis, is intended to appeal chiefly to the lay public. The exhibition will be widely advertised in and about Minneapolis and a large attendance is expected of persons to whom popular health education is addressed.

Here is an unusual opportunity for those engaged in health education to study exhibits in use, noting the response of visitors to different methods of display and to different subject matter. The exhibits are being prepared by public and private health agencies of Minnesota under the direction of Richard O. Beard, M.D.

For the Head-line Reader—Statistics do not always lend themselves to picturesque comparisons, or to other forms of simplification which help to make the average reader grasp their significance. Perhaps the following bewildering sequence of percentages must stand as it is:

> Practically 62 per cent of all surgical cases remained in the hospital less than 11 days while only about 43 per cent of the medical cases stayed less than 11 days. Most of the obstetrical cases come within the 11–19 day period, while the highest percentage of cases requiring more than 20 days is to be found in medical cases where nearly 42 per cent of them require more than 20 days as compared with 17 per cent of surgical cases and 3 per cent obstetrical cases.

Blue pencil about half the words in those two sentences, and the statistical facts will stand out more clearly. Why not try this form: "Six in 10 surgical cases left the hospital in less than 11 days"?

In contrast to the above is the opening sentence of a news story on a similar report:

> The average New Yorker, entering a local hospital at 9 o'clock next Monday morning as a sick man, will be discharged at 6:27 p.m. on the second following Wednesday, according to a survey just completed by officials of the United Hospital Fund. . . .

The Illinois Department of Health (press release dated July 14, 1929) makes graphic the cost of smallpox:

> Spending together more than 300 years in quarantine is what 5,400 people have already done this year in Illinois because of smallpox. The State Department of Health has spent about $67,000 for the same reason. Nobody wants the disease and nobody wants to be vaccinated. Hundreds of years in quarantine and thousands of dollars in useless expense is the result.
>
> So far about 2,700 cases of smallpox have been reported in Illinois this year. For each case at least two people have been under quarantine for no less than 21 days. Travel and salary of state health authorities for all time spent in combatting smallpox amounts to an average of about $25.00 per case. Three or four thousand cases of smallpox per year, therefore, costs a sizeable sum and causes no insignificant number of people to spend a considerable amount of time in almost solitary confinement.

A Governor Looks at Public Health—Said Governor Franklin D. Roosevelt at the recent Annual Conference of Health Officers and Public Health Nurses of New York:

> . . . In the final analysis public health must depend on the locality. Today in county after county the average amount spent for health improvement is under 50 cents per capita, while those same counties spend $4, $5, and $6 for improvement of highways. This is just an example. I do not want the highway work to stop, but the proportion is out of line if we figure it on the population and the future generation. . . .
>
> Some of the widely scattered rural counties are doing better work than those containing large civic communities. It comes down to the interest aroused among the people themselves. . . . If we can obtain from the indi-

viduals of the electorate the right to see that the health of communities is kept up to the best modern standards we will be doing a fine piece of work.

The Thirteenth National Baby Week—In July, 1929, England celebrated the thirteenth consecutive annual National Baby Week.

In the development of its activities the Council found that in addition to the one week's intensive campaign during the first week in July, local Baby Weeks became very influential and important. These local campaigns were and still are being held at various periods throughout the year—at times found to be the most favourable to the area concerned in the campaign. The National Baby Week Council reports yearly an increasing number of these local baby weeks.

DATES AHEAD

Nov. 11–17—"American Education Week." Address: National Education Association, Washington, D. C.

REGRETTABLE BUT TRUE

That one city department of health devoted a dozen pages to "Causes of Death" and other statistical matter—followed by three pages of interesting text. Why not reverse the arrangement?

WORDS

Few people have a "physician." Most people "go to a doctor." Is there a weak spot in the health examination campaigning in the repeated urging to see "*your* physician"?

"Human and animal *dejecta*"; "*foci* of infection"; "water courses *traversing* or draining inhibited regions"; "contaminated by *human feces*."—A state department press release.

"The variations in temperature, both seasonal and *diurnal*." In a radio talk.

An Explanation with Regrets—A seven weeks' absence from the office—the longest period away from business in ten years or more—is responsible for the absence of this department from one issue of the JOURNAL. The editor deeply regrets his inability to prepare copy in advance.

The department will appear as usual in subsequent issues.

BOOKS AND REPORTS

A Lost Commander. Florence Nightingale—*By Mary Raymond Shipman Andrews. New York: Doubleday, Doran,* 1929. 299 pp. Price, $3.00.

In the pages of the glamorous story of public health, Florence Nightingale deserves an exalted place. As the founder of modern nursing, her dramatic career has been the inspiration for a legion of women whose lives have been consecrated to healing the sick or carrying to the people the gospel of good health. The narrative has been told many times and it is one with which every sanitarian should be familiar.

This particular retelling of what ought to be a well-known tale is the work of a trained novelist turned biographer. The book is competently, at times beautifully, written, but it also bears some of the marks of journalism. The first chapter, for example, rather effusively, if effectively, describes a romantic incident which has never been authenticated, as the author admits. The second chapter is inclined to be equally imaginative, but after that the book swings into facts, such as the glorious story of Scutari, where "the Lady with the Lamp" rendered her first conspicuous service.

Notable as she was in the Victorian era, Florence Nightingale was no plaster saint, though certainly not the disagreeable martinet she has been painted in the bilious biography of the cynical Strachey. There seems, however, a tendency toward glorification in this book by Mrs. Andrews. Nor was Miss Nightingale a "lost commander," but a truly great leader whose influence on English progress in certain fields, such as sanitation, hospitals, nursing, and even medicine, was tremendous—and lasting.

The book is a pleasure to read, not only for its excellent content, but because of the attractiveness with which it has been printed.

"There were many facets to that diamond called Florence Nightingale," says the author. There were indeed; but the really brilliant narrative of her life remains to be told. Capable and interesting as is this one, a better will be written some day, not by invitation from a metropolitan publishing house, nor on the whim of an established writer, but by some obscure nurse or sanitarian who has lived the same romance that was the life of the Lady with the Lamp. JAMES A. TOBEY

Ergebnisse der Sozialen Hygiene und Gesundheitsfürsorge—*Edited by Prof. Dr. A. Grotjahn, Professor of Social Hygiene, Prof. Dr. L. Langstein, Professor of Children's Diseases, and Prof. Dr. F. Rott, Docent in Social Hygiene, the University of Berlin. Leipzig: G. Thieme,* 1929. Vol. 1, viii + 440 pp., 31 figs. Price, M. 30, bound, M. 33.

The aim of this new journal in the field of social hygiene is to present trustworthy and critical summaries by competent specialists of the progress made in the various subdivisions of this rapidly advancing science, and in its applications. It aims to summarize the results of fundamental investigations, of the more specialized aspects of social hygiene, and of the borderlands of this subject. It aims to meet the needs of investigators and of physicians engaged in social insurance, of those in the clinical and laboratory fields, and of those

interested in the organization and administration of measures of social hygiene.

It aims to represent the fields of eugenics and reproduction, constitutional and anthropometric investigations, hygiene and sanitation, education in hygiene, vital statistics and population changes, control of epidemics and sanitary legislation, social insurance and health promotion, social hygiene for mothers, children, youths, and the aged, care of cripples, the tuberculous, and those with venereal disease, social psychiatry and psychopathic enterprises, prevention of alcoholism and narcotism, social statistics, hospital facilities and hospitalization, the relations of health measures to the growth of public and private interest in the promotion of social hygiene.

The first volume has 12 special summaries by specialists, dealing with such subjects as the decline in infant mortality, contraception, sterility and mortality in the districts of Berlin, with reference to their social composition, school dental service as a community health measure, and the theoretical program of social hygiene. American readers will be interested in Dr. Béla Schick's discussion of protective immunization against diphtheria in the United States.

This new addition to the "Ergebnisse" of the German scientific press fills a distinct need in a growing field, especially that created by the growth of social efforts along the line of preventive medicine. C. A. KOFOID

Foods of the Foreign-Born in Relation to Health—*By Bertha M. Wood. Boston: Barrows. (2d ed.)* 1929. 110 pp. Price, $1.25.

Diets employed in hospitals and institutions and those recommended at clinics and dispensaries serving large numbers of foreign born persons ought to be adapted, within the limits of sound nutrition, to the dietary habits of the different nationalities served. In order to do this satisfactorily, it is, of course, essential for doctors and dietitians, nurses and social workers, to know something about the food customs of the various racial groups.

In this little book the author presents much useful information about the foods of Mexicans, Portuguese, Italians, Hungarians, Poles and other Slavic peoples, Near East peoples, and Jews. Suggestions are also made regarding therapeutic diets for special purposes. In these days of frenzied prohibition it is interesting to read that the daily diet of the Hungarians in their own country contains whisky and that these combinations do not change much here. Probably not.

A new appendix in the second edition, which has been published about 7 years after the first, gives the proportions of protein, fat, and carbohydrate in the various food combinations mentioned throughout the text. If it also gave the minerals and vitamin content, it would possess much greater nutritional significance.

The book is fairly well printed and has an index of recipes. There is a foreword by M. M. Davis, written in 1921. This book ought to be useful for its purpose. JAMES A. TOBEY

Communicable Diseases for Nurses—*By Albert G. Bower, M.D., and Edith B. Pilant, R.N. Philadelphia: Saunders,* 1929. 327 pp. Price, $3.00.

This book seems to give all the information in regard to communicable diseases found in the most up-to-date books on the subject designed for public health workers, with the additional distinction of laying most emphasis on practical nursing technic and care in the treatment of these diseases.

The authors state that acquired active immunity from diphtheria is still

in an experimental stage, when 8 or 10 cities in the United States have reduced their death rate from diphtheria to almost zero by the widespread use of toxin-antitoxin. The authors also state that large doses of toxin-antitoxin may be given and repeated as often as necessary to obtain results, when it has been thought that the best method is to give the one large maximum dose in the first place and obviate the necessity of repeated doses.

This is a valuable book for not only nurses but housewives, and even physicians, to possess. It is easy reading, has a good glossary and good illustrations, some of them in colors.

EVA F. MACDOUGALL

The Struggle for Health—*By Richard H. Hoffman, M.D. New York: Liveright,* 1929. 341 pp. Price, $3.50.

The most conspicuous struggle here is the laborious endeavor of the author to present the entire history of medicine for popular consumption. The result is a somewhat ponderous, closely printed volume which depicts, with many collateral remarks obviously intended to be clever, the development of medicine from the days of Pithecanthropus Erectus to Freud.

Despite a dull beginning, much of the book is entertaining, especially when the author drifts into anecdote. In the apparent attempt to include every detail, however, much of the material becomes a mere catalog of facts, an array which gets bewildering rather than fascinating, as the subject warrants.

The book displays a rather poor sense of relative values in the story of health. Thus, Pasteur, the founder of modern preventive medicine, who deserves at least a whole chapter in any such work, is accorded only about 4 pages, just half the space devoted to Aureolus Theophrastus Bombast von Hohenheim, commonly called Paracelsus, who was as much a charlatan as anything else. Similarly, Lord Lister and Florence Nightingale are honored here with only a page each. In the chapter on mental hygiene there is no mention at all of Dorothea Dix or Beers, and only a sentence or two on Pinel.

This lack of balance is further accentuated by a sudden transition from historical narrative to a discourse on the internal secretions, forming Chapter XV, which is, moreover, one of the most interesting parts of the book. In a chapter on X-ray there are several pages on nutrition, in which only 3 of the 6 or more known vitamins are described, though the book was obviously written quite recently.

This book is well printed with respect to freedom from typographical errors, but the print is several points too small. By what process of logic does a publisher issue a book on a health topic with print that might cause eye strain in many sensitive readers? Such a poor conception of hygiene deserves condemnation.

The sanitarian directly interested in medical history may find this book of value, and the layman may derive some entertainment from it, but there are many standard works not yet improved upon which are available to either group of readers. This one is not "the" struggle for health, but a struggle.

JAMES A. TOBEY

The Physical Welfare of the School Child—*By Charles H. Keene, M.D. Boston: Houghton, Mifflin,* 1929. 505 pp. Price, $2.40.

Books of substance and "easy reading" qualities are always sure of readers, especially in the field of public health. This new book by Keene is full of valuable material, simply written, and has a good index.

The plan of the book is to set forth

"the threefold duty of the school" (protection, correction and prevention) through a discussion of the "seven parts of a unified program": sanitation of the school plant; physical education; health supervision; hygienic arrangement of the school program; health of teachers; training of teachers; health training and instruction. These subdivisions are not treated exhaustively, of course, but in sufficient detail for the purpose. References are constantly given to sources of more extensive treatment of the given topic.

So much for a few of the obvious strong points of the book, of which there are many. It is a book written by a man of wide experience and strong convictions—both experience and convictions are very evident. The reviewer has the uneasy feeling that in spots the book may convey to the inexperienced student in normal school or college a sense of finality concerning certain highly controversial subjects which transcend the public health field and get into that of economics, of government or what not. Some will wonder whether it is entirely in accord with sound public policy to turn our public schools into surgical dispensaries where the child has his teeth filled, pulled, straightened; his tonsils snatched from him; his eyes treated—all at public expense.

Somewhat disproportionate space is given to the question of who should administer the health supervision program in the schools, the stand being taken that unquestionably it belongs almost solely to the educational authorities. As a matter of fact, it is usually carried out equally badly by school or health department. Both, on the other hand, would seem to have responsibilities toward the school child which cannot be dodged.

What has been said above concerning certain controversial aspects of the book merely indicates that it is stimulating, and heaven is always to be praised for a stimulating book. The reviewer heartily recommends it to school physicians, nurses, public health workers in general, as well as to discriminating students in college or normal school.

MERRILL E. CHAMPION

Morphologic Variation and the Rate of Growth of Bacteria—*By Arthur T. Henrici, University of Minnesota. Springfield, Ill.: Charles C. Thomas.* 194 pp. Price, $3.00.

As a source of comfort this contribution of Henrici's should be welcome to both camps of the forces battling over the subject of bacterial variation. As a result of tedious but careful research aided by clear and accurate analysis this author has furnished a new basis for consideration of the problems related to the fixity of bacterial species and the study of "life cycles." The work is primarily concerned with studies of the early stages of bacterial growth in which it is shown changes fully as significant as those occurring in old cultures are invariably found. Enumeration, measurement, and study of morphology of bacterial cells has been carried on throughout the entire period of bacterial growth, and by judicious use of statistical methods the conclusion has been reached that "morphologic variations of bacteria are an expression of the variations in growth rate."

It is not within the province of the reviewer to evaluate the experiments performed, nor to comment upon the significance of the conclusions reached. It is sufficient to state that this contribution warrants very careful study by all who are interested in the subject of bacterial variation.

Certain features of the monograph deserve special mention however. The publications of such workers as Lohnis, Enderlein, Almquist, Mellon and others relating to life cycles in bacteria are so confusing to many readers, partly be-

cause of the multiplicity of terms, as to render comparison and evaluation difficult if not impossible. Henrici in his opening chapter reviews this literature in a clear and concise manner, and leaves one with a very clear understanding of the present status of the problem. The remainder of the book is concerned with a report of the experiments performed and an analysis of the results obtained. One is impressed with the extent of the researches involved, with the ingenuity of the methods used, and with the excellence of the analyses given. The writer can scarcely be accused of being dogmatic although his conclusions support the monomorphistic view. He does not deny the existence of life cycles, but logically points out the conditions which must be met before such sexual development of bacteria can be accepted as proved.

The book is well written, well indexed and typographically pleasing.

N. W. LARKUM

A Manual of Helminthology—*By H. A. Baylis. New York: William Wood,* 1929. 303 pp., 200 figs. Price, $10.00.

This is a very welcome and valuable manual of the parasitic trematodes, cestodes, nematodes and related round worms known to occur in man and in the domesticated animals of temperate regions and the tropics. It will be an exceedingly useful work since there has been much written in these fields in recent years and the literature of the subject is widely scattered in many journals difficult of access except in the few great libraries of the world. The author's access to the library and the collections of the British Museum has given him exceptional facilities. His work is a synoptic treatment, with brief but well set-up accounts of the genuses and species of these parasitic worms of medical and veterinary interest. There are many new illustrations and good host parasite lists. It is of interest to note in these lists that man has to his credit as parasites 30 flukes or trematodes, 28 tape worms or cestodes, 58 nematodes or round worms and 3 Acanthocephala or thorny-headed worms, a larger number than any one of his domesticated animals has acquired. Possibly this is an index of medical as against veterinary interests in parasitology rather than an indication of differential sanitation or species susceptibility to infection.

C. A. KOFOID

Everyday Doings in Healthville—*By Emma Serl. New York: Silver, Burdett,* 1929. 128 pp. Price, $.68.

The fundamental health activities which should be carried out in the daily routine life of every child are emphasized in story form. The animal characters, Bettie and Bobbie Squirrel, have been personified by the author as inhabitants of Healthville in a manner which will interest the primary grade child.

This supplementary reader has been illustrated by Harry E. Wood, whose illustrations of children's books have created much favorable comment lately.

ANNA B. TOWSE

Guide for a Health Program—*By Jessie I. Lummis and Willidell Schawe. Yonkers, N. Y.: World Book Co.,* 1929. 196 pp. Price, $1.24.

The authors, who have recently contributed a series of health readers to the meager supply of health education material, have prepared this teacher's manual for the first, second and third grades. Teachers of health education will welcome this additional aid of detailed activities for a health education program and the reasons thereof. The manual is profusely illustrated and carries a section listing the materials that can be obtained for use in the schoolroom.

ANNA B. TOWSE

Psychiatry in Industry—*By V. V. Anderson, M.D., M.A., Director of Medical Research, the R. H. Macy & Co., Inc. New York: Harper,* 1929. 364 pp. Price, $4.00.

A book in this field from the psychiatrist's standpoint which also deals extensively with industrial psychology is welcomed. Four years of personnel problems in one of the largest mercantile establishments of the country where the employment office handles 15,000 cases a year, with the aid also of psychiatric social workers, has afforded a considerable experience. The book contains many summaries, extensive case discussions, the relative values of various mental tests along with their descriptions, the application of psychiatry to administrative methods, and a pleasing touch of somewhat philosophical observations. Psychological tests are found to have but a limited part in adequate job placement while a thorough medical and psychiatric study comes nearer solving the problem.

Radical changes in personnel and duties in different departments of the business were brought about with resulting great improvements through the methods used.

The chapter on health is devoted to chronic hospital users, compensation and sick leave cases, situation-reaction cases, fatigue problems, and frank cases of nervous and mental disturbances. Practically nothing is mentioned of associated physical findings and medical treatment so that one is a little skeptical whether, for instance, the 35-year old female described on pages 160–164 who had "nothing of importance except 20 pounds underweight" and complained of a group of symptoms suggestive of a toxicosis, possibly endocrinal, was entirely a psychoneurotic. Where the usual hospital experience reports about 25 per cent of patients suffering from neuroses, the author is convinced there is a much larger percentage in the rank and file. About 9 per cent of those examined physically for employment were rejected because of physical disorders.

Rather striking results of the psychiatric handling of the firm's automobile drivers are described. Among 450 of these there occurred a monthly reduction of 50–82 per cent in accidents, and a decrease of 92 per cent in labor turnover within one year, apparently consequent upon the tests. However, the reviewer feels this field is still too new to accept too great positivity of statement as to cause and effect.

There is an index, but no bibliography, although a half-dozen references are mentioned as of value for employment reviewers on page 193. The type is large, the reading easy and of excellent literary style. An appendix shows the inquiry forms and sample tests used. The book should appeal to professional and business men and to students as well as to all interested in personnel problems. EMERY R. HAYHURST

An Hour on Health—*By Morris Fishbein, M.D. Philadelphia: Lippincott,* 1929. 158 pp. Price, $1.00.

This little book belongs to the "One Hour Series," and one may well spend more than that time on its perusal. Beginning with the question of the length of life, which interests everyone, even those who profess a great desire to depart from this wicked world and enter the realms of the blessed, it covers in succession a number of subjects relating to health.

Perhaps the outstanding feature of the book is the attack on fads which are treated both with humor and philosophy. The faddists and the fakers understand human nature better than the average of their fellowmen. The author emphasizes this point in saying that is doubtful if any religious cult could achieve complete success unless it laid stress either on food or sex. We

agree with him that practically all faddists take themselves too seriously, and develop their special twists at the expense of the rest of their nature. Certainly the average faddist of any kind is an intolerable bore.

The book is easy reading, generally sound, and within its scope can be recommended. M. P. RAVENEL

Aerztliche Sachverständigen-Tätigkeit auf dem Gebiete der Hygiene—*Von Geh. Med.-Rat. Dr. O. Solbrig. Berlin: Urban & Schwarzenberg,* 1929. xii + 514 pp., 47 figs. Price, M. 33 (Bound, M. 39).

This is Volume 10, part 2, of Dr. Dittrich's series of informational professional handbooks and deals with hygiene, largely from the standpoint of sanitation and sanitary engineering, with minor attention to personal hygiene. The first section deals with soil in relation to air, water, and bacteria; water, its sources, physical and chemical properties, and its biological and bacteriological examination and control; mineral waters and ice. The second is concerned with nutrition, the sources of food, animal and vegetable, and of stimulants, clothing, and dangers to health from dirt, poisons, and dyes; and with dwellings, with special reference to factors of material, construction and arrangement as these affect health, and sanitary precautions in heating, lighting and ventilation.

The third chapter is concerned with municipal hygiene, city planning of residential districts and public institutions, transportation by ship and rail; water supply, sources, purification, removal of iron and manganese, softening, and organization and equipment of a scientific water control system; sewage disposal by various mechanical and biological methods, intermittent filtration, activated sludge, etc.; domestic systems, disinfection and methods of investigation; and a final section on mass feeding of children, soldiers, prisoners, the care of people's kitchens, consumers' coöperatives, municipal markets, abattoirs, supervision of the traffic in foods and inspection of imports.

The closing chapter deals with school and industrial hygiene. The former is treated from the standpoint, first of the buildings, their construction and care, and second from that of the personal hygiene of the pupil and the function of the school physician and dentist.

Industrial hygiene is discussed in its generalities, such as dust, gases, hours of labor, women and children in industry. There follows a detailed discussion of the various subdivisions of trades and industries which have reached so wide a diversification in modern industrial Germany. The work is replete with information, very well organized, significantly illustrated, and comprehensive in scope. It gives an excellent picture of the best German practice in hygienic matters where the sanitary engineer and public health physician are concerned.

C. A. KOFOID

Laboratory Directions in College Zoology—*By Henry Lane Bruner. New York: Macmillan,* 1928. 163 pp. Price, $1.40.

This is the laboratory outline accompanying the elementary course in zoology at Butler University. It follows the usual outline of a progressive survey of animal types from amebas—in this case not to man, but to the pigeon—with an introductory exercise on protoplasmic circulation in *Elodea.*

The course is planned for a year's work with two laboratory sections weekly. The invertebrates studied include the tape worm and *Ascaris.* Considerable attention is given to the physiological relations of the organs studied.

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Psychiatry in Industry—*By V. V. Anderson, M.D., M.A., Director of Medical Research, the R. H. Macy & Co., Inc. New York: Harper,* 1929. 364 pp. Price, $4.00.

A book in this field from the psychiatrist's standpoint which also deals extensively with industrial psychology is welcomed. Four years of personnel problems in one of the largest mercantile establishments of the country where the employment office handles 15,000 cases a year, with the aid also of psychiatric social workers, has afforded a considerable experience. The book contains many summaries, extensive case discussions, the relative values of various mental tests along with their descriptions, the application of psychiatry to administrative methods, and a pleasing touch of somewhat philosophical observations. Psychological tests are found to have but a limited part in adequate job placement while a thorough medical and psychiatric study comes nearer solving the problem.

Radical changes in personnel and duties in different departments of the business were brought about with resulting great improvements through the methods used.

The chapter on health is devoted to chronic hospital users, compensation and sick leave cases, situation-reaction cases, fatigue problems, and frank cases of nervous and mental disturbances. Practically nothing is mentioned of associated physical findings and medical treatment so that one is a little skeptical whether, for instance, the 35-year old female described on pages 160–164 who had "nothing of importance except 20 pounds underweight" and complained of a group of symptoms suggestive of a toxicosis, possibly endocrinal, was entirely a psychoneurotic. Where the usual hospital experience reports about 25 per cent of patients suffering from neuroses, the author is convinced there is a much larger percentage in the rank and file. About 9 per cent of those examined physically for employment were rejected because of physical disorders.

Rather striking results of the psychiatric handling of the firm's automobile drivers are described. Among 450 of these there occurred a monthly reduction of 50–82 per cent in accidents, and a decrease of 92 per cent in labor turnover within one year, apparently consequent upon the tests. However, the reviewer feels this field is still too new to accept too great positivity of statement as to cause and effect.

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HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

New Jersey—This 51st annual report reviews at the outset the morbidity and mortality data for the year 1927, and shows a death rate of 11.4, the lowest ever recorded for this state. In 66 communities, representatives of the State Health Department assisted local health and educational bodies by introducing the subject of diphtheria immunization to the public, exhibiting motion pictures, supplying literature and record forms, and conducting clinics. It is estimated that throughout the state 173,000 children have been immunized in public clinics, not including those who were immunized by physicians in their private practice. This is one-fifth of the susceptible children in the state.

An epidemiological study of an outbreak of paratyphoid fever proved it to be transmitted through unpasteurized milk. Further spread of the disease was promptly prevented when department representatives stopped the sale of raw milk. A typhoid fever outbreak was also traced to a raw milk supply. In last year's report, reference was made to an extensive outbreak of scarlet fever (more than 200 cases). As usual, a missed human case of the disease was considered responsible. An unusual feature was that a cow in a certain dairy herd developed inflammation of the udder which yielded hemolytic streptococci.

Studies of the organism isolated from the milk showed it to be indistinguishable from the streptococcus of scarlet fever. "The udder infection appears to be the logical explanation of the massive infection of the milk, and stresses anew the importance of pasteurization."

The infant mortality rate of the state continues to decline, and 18 communities have adopted the department's continuous child hygiene program. In an attempt to determine upon a practical maternity hygiene plan suitable for municipal health department practice, the Bureau of Child Hygiene has set up an experimental prenatal center where a 5-year program will be carried out. The report abounds in good statistical tables and charts with appropriate descriptive text.

Rockford, Ill.—Rockford reports for 1928 a population of 83,700, a death rate of 9.18, a birth rate of 15.7, and an infant mortality rate (all rates corrected for residence) of 36.07. Vital statistics are analyzed in considerable detail. This annual report is made attractive by the use of organization charts, graphs and special cuts, with statistical data accompanied by descriptive text.

It is gratifying to note that over 98.8 per cent of the milk supply is pasteurized. Continued progress in the control of communicable disease is noted, including tuberculosis. In 1901, there was a tuberculosis rate of 169 as compared with 48 in 1928. In September, 1928, a tornado resulted in 14 deaths, with over 100 accidental injuries. City and county officials cooperated in public health, first aid and rehabilitation work following this catastrophe. A classified financial statement indicates an expenditure of $33,134 by the health department, in addition to expenditures by voluntary agencies whose coöperation is acknowledged.

New Brunswick Province—The 1928 report of this province is of special interest on account of the attention given to problems of mental hygiene, infant welfare, tuberculosis control, and a plan for county health units. Con-

siderable progress is being made in lowering the infant mortality and tuberculosis rates, and consideration is being given to the possibility of instituting a coöperative plan with the federal government for county health units. A comprehensive statement of health department activities is made by the medical officer, and this is followed by more detailed bureau reports which abound in well prepared statistical tables.

A birth rate of 25.5, a marriage rate of 7.0, and a death rate of 11.9 per 1,000 population are recorded. The infant mortality rate has dropped from 134.9 in 1920 to 96.0 in 1928. The estimated population of the province is 411,000.

Ottawa—This city, with a population of 122,731, reports for 1928 a birth rate of 24.8, a death rate (corrected) of 11.06, and an infant mortality rate of 104.07. Smallpox reached epidemic proportions during the last 2 months of 1927, and January of 1928, cases being chiefly among adults and preschool children. During 1928, there were 382 cases reported, with no deaths, 286 having been treated in hospital. Tuberculosis continued to decline, a death rate of 73 being recorded, 82 per cent of the deaths being of pulmonary form. The report contains many statistical tables, the analyses of vital statistics by age, sex, and nationality being of special interest.

Pennsylvania Milk Inspectors—To health officers and milk control officials, the 224-page report for 1929 of the Pennsylvania Association of Dairy and Milk Inspectors will prove valuable. Papers deal with bovine tuberculosis eradication work, undulant fever, arrangement and remodeling of dairy barns, clean and safe milk for small communities, heat-resistant and heat-loving bacteria, coöperation between states regarding conditions surrounding the production of milk for interstate shipment, recording thermometers, ordinances, and pasteurization problems.

Lorain County, O.—Printed on good paper, with a soft green, well designed cover, this 1928 report for a county health district of 33,571 inhabitants occupies 41 pages. In a foreword, the health commissioner outlines important features of the district and its health organization. This district comprises 10 villages and 20 townships, with a land area of 476 square miles. In addition to the board of health of 5 members, there is a district advisory council, which consists of the mayors of the 10 villages and the chairmen of the boards of trustees of the 20 townships. Besides the medical health commissioner, the personnel consists of a deputy commissioner, a part-time school physician, 3 public health nurses, a bacteriologist-chemist, and a clerk. The budget, as shown by a classified statement, amounts to 58 cents per capita.

A crude death rate of 12, a birth rate of 14.9, and an infant mortality rate of 48.1 are recorded for the year. As considerable toxin-antitoxin work had been done, it was decided to perform Schick tests on a group of 1,789 school children. Of 1,046 who had received 3 or more T–A injections, 77.6 per cent gave negative Schick tests, while of 671 who had received no injections, 30.7 per cent gave negative results. There were 72 children who had received one or two injections, and of these 59.8 per cent gave negative reactions. The intervals between last injections and Schick tests are not stated.

Among the outstanding features of the year are noted the following: Six employees traveled over 50,000 miles in connection with the work. Three nurses made 28,800 inspections of school children, and 2,898 visits of various kinds to homes and schools. The

bacteriologist analyzed 3,194 specimens and made 189 dairy farm and milk plant inspections. Over 49,000 pieces of mimeographed material were distributed by the department, and 94 health talks were given to Parent-Teacher organizations and civic clubs, in addition to 539 health talks to school groups.

Tennessee—One of the best state health department reports received this year is that of Tennessee for 1926–1927. The report opens with an enlightening statement regarding general policy, and the responsibility of state and county governments.

> There is, therefore, no more fundamental responsibility of government, considered from the economic point of view only, than the responsibility to serve and to protect the public health. . . . The State Department of Public Health in Tennessee is committed to a policy which recognizes local responsibility for public health activity and that the health program for the state as a whole must be built on a solid foundation of well organized, effective local full-time health departments organized under trained leadership and manned by trained personnel.

Extension of local rural health work through full-time county departments is being stimulated.

A second major element is that the state department shall so organize its own activity as to render expert consultant service to local departments of public health and act as a coördinating influence in the development of a common program of activity and high standards of service for local health agencies. A third element provides for leadership rather than compulsion, and a fourth for a recognition of the fundamental contribution to public health progress which can be made by the practicing physician.

Following a summary of health conditions, the report takes up the work of various divisions, including administration, local organization, epidemiology, vital statistics, laboratories, sanitary engineering, child hygiene and public health nursing, and health education. This most important phase of public health work (health education) is now receiving due attention by the department. A director has been secured and educational material covering all subjects pertaining to public health has been prepared. Plans are under way for the coördination and further extension of health instruction in the educational institutions of the state. The attractiveness of the report is increased by the careful preparation and selection of good statistical tables, charts, and photographs, which add interest to the text.

BOOKS RECEIVED

THE MODERN BABY BOOK AND CHILD DEVELOPMENT RECORD. By John E. Anderson and Florence L. Goodenough. New York: Norton, 1929. 398 pp. Price, regular ed. $5.00; de luxe ed. $10.00.

REGIONAL PLAN OF NEW YORK AND ITS ENVIRONS. Vol. VIII. Physical Conditions and Public Services. New York: Committee on Regional Plan of New York and its Environs, 1929. 209 pp. Price, $3.00.

CHEMISTRY IN DAILY LIFE. By Samuel Glasstone. New York: Dutton, 1928. 250 pp. Price, $2.25.

RICKETS, INCLUDING OSTEOMALACIA AND TETANY. By Alfred F. Hess. Philadelphia: Lea & Febiger, 1929. 485 pp. Price, $5.50.

THE CHALLENGE OF CHRONIC DISEASES. By Ernst P. Boas and Nicholas Michelson. New York: Macmillan, 1929. 197 pp. Price, $2.50.

THE CHILD'S HEREDITY. By Paul Popenoe. Baltimore: Williams & Wilkins, 1929. 316 pp. Price, $2.00.

HEREDITY AND PARENTHOOD. By Samuel C. Schmucker. New York: Macmillan, 1929. 322 pp. Price, $2.50.

INCAPACITY OR DISABLEMENT IN ITS MEDICAL ASPECTS. By E. M. Brockbank. London: Lewis, 1926. 120 pp. Price, $2.00.

COMMUNITY RECREATION. By James Claude Elsom. New York: Century, 1929. 278 pp. Price, $2.25.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Before and After in Mental Hygiene—What people used to think and what they are now beginning to realize in child training are interestingly contrasted.

ANON. Old and New Version of Child Training, Ment. Hyg. Bull., 7, 6: 4 (June), 1929.

Progress in Nutrition—Another of Dr. Burnett's invaluable summaries of the work in nutrition throughout the preceding year. Excellent source material, especially for writers in this branch of health work.

BURNETT, F. L. Progress of Nutrition, New England J. Med., 200, 26: 1329 (June 27), 1929.

Preventing Tuberculosis with BCG—An answer to the statement that BCG may be virulent made by Petroff *et al.* Petroff's methods are questioned and his conclusions contradicted. Finally, the immunization of exposed infants is urged. Very emphatic throughout.

CALMETTE, A., and PLOTZ, H. Protective Inoculation against Tuberculosis with BCG, Am. Rev. Tuberc., 19, 6: 567 (June), 1929.

Maternal Mortality—That the problem of preventing needless maternal mortality is insistent everywhere is evidenced by this British discussion. What is done in that country is recounted, and the need of educating the public is stressed.

CASSIE, E. Maternal Mortality and Allied Problems, Pub. Health, 42, 10: 329 (July), 1929.

Infant Growth—The effect of cod liver oil added to diet suggests that the accepted standards of infant growth are too low.

DANIELS, A. L., *et al.* The Relation of Rate of Growth in Infants to Diet, Am. J. Dis. Child., 37, 6: 1177 (June), 1929.

Cancer, Urban and Rural—That *recorded* cancer deaths are probably lower in rural than in urban areas (after due correction for age composition of the population) is the conclusion of this interesting study of cancer mortality statistics in New York State.

DE PORTE, J. V. Extent to Which Residence Influences the Recorded Death Rates from Cancer in the State of New York, Am. J. Hyg., 10, 1: 201 (July), 1929.

School Room Ventilation—All who want to keep up-to-date on the school-room ventilation question will read with interest this latest statement of the secretary of the New York Commission.

DUFFIELD, T. J. The New York Commission on Ventilation. Quart. Bull. (Milbank Memorial Fund), 7, 3: 67 (July), 1929.

Urban vs. Rural Health—Relative changes in death rates urban and rural, and some of the probable causes are very interestingly presented.

EMERSON, H., and PHELPS, E. B. The City Gains on the Country, Survey Graphic, 42, 9: 469 (Aug. 1), 1929.

Undulant Fever—Another summary of our present-day knowledge of undulant fever, and a good one.

HASSELTINE, H. E. Current Studies in Undulant Fever, Pub. Health Rep., 44, 28: 1659 (July 12), 1929.

Epidemiology of Paratyphoid—An inclusive consideration of the differential diagnosis, epidemiologic investigation

and control measures for the paratyphoid group.

JORDAN, E. O. The Epidemiology of Paratyphoid Infections, J. Prev. Med., 3, 4: 279 (July), 1929.

Cancer Clinics—A committee report on methods of improving the service for cancer patients. The pioneering work in Massachusetts is covered in the survey.

EWING, J., *et al.* The Medical Service Available for Cancer Patients in the United States, J. A. M. A., 93, 3: 165 (July 20), 1929.

Lead Poisoning—How lead poisoning occurs in a storage battery plant and how it can be prevented is the theme of this exhaustive report. Periodic physical examinations can forestall acute poisoning.

GREENBURG, L., *et al.* A Study of Lead Poisoning in a Storage Battery Plant, Pub. Health Rep., 44, 28: 1666 (July 12), 1929.

Enuresis—That enuresis is a conduct disorder which can be stopped when the child so desires is the postulate of this paper. Other treatment than that of making the patient assume his responsibility is against the child's interest. Read it.

HAMILL, R. C. Enuresis, J. A. M. A., 93, 4: 254 (July 27), 1929.

Health Education for Children—The health educational methods employed in the Bellevue-Yorkville demonstration district cannot be summarized here, but that is unnecessary, for this paper will be read by all interested health workers.

LAMKIN, N. B., and DU PAUL, M. E. Health Education in Schools in the Metropolitan Health Demonstration Area, Quart. Bull. (Milbank Memorial Fund), 7, 3: 53 (July), 1929.

Body and Mind—One broad conclusion of this comprehensive study of Illinois children is that the number of physical defects decreases and the physical condition improves with the increase in the height of the I. Q. The authors wisely do not try to interpret this relationship.

KEMPF, G. A., and COLLINS, S. D. A Study of the Relation between Mental and Physical Status of Children in Two Counties in Illinois, Pub. Health Rep., 44, 29: 1743 (July 19), 1929.

Meat Diets—Two subjects (former arctic explorers) lived on an exclusive meat diet for a year with no ill effects—in fact, one subject's hair stopped falling out. Vegetarians take notice.

LIEB, C. W. The Effects on Human Beings of a Twelve Months' Exclusive Meat Diet, J. A. M. A., 93, 1: 20 (July 6), 1929.

Tuberculosis Immunization—Another paper upholding Calmette's claim that exposed children may safely be immunized against tuberculosis with BCG.

MAGUIRE, W. J. Early Immunization as a Preventive Measure against Tuberculosis, J. State Med., 37, 7: 421 (July), 1929.

Diphtheria in Palestine—The apparent absence of diphtheria combined with a high immunity rate can be accounted for only on the assumption that the disease is so mild as to be unrecognizable. Why the disease is not detected is being investigated. Very interesting.

MANN, M., and KLIGLER, I. J. The Schick Test in Palestine, a Country of Low Diphtheria Prevalence, J. Prev. Med., 3, 4: 309 (July), 1929.

Infant Mortality Causes—After scrutinizing the conditions within and without the infant which influence his ability to overcome the first year's hazards, the author proceeds to dissect the typical child hygiene program. Good for the soul.

SMITH, R. M. The Important Causes of Infant Mortality. Child Health Bull., 5, 4: 97 (July), 1929.

Endemic Typhus Fever—As there is endemic in the United States a disease resembling typhus which is not compatible with louse transmission from man to man, it must be that it is spread from some other source, probably some rodent, by a blood sucking parasite. An interesting speculation.

MAXCY, K. F. Typhus Fever in the United States, Pub. Health Rep., 44, 29: 1735 (July 19), 1929.

Meningitis Control Measures—An honestly pessimistic summary of experience in attempting to prevent the spread of this disease ending with the quotation from Rosenau that no measures so far taken have materially influenced the course of epidemics or prevented the spread of meningitis.

MCCOY, G. W. Meningococcus Meningitis and Measures for Its Control, Pub. Health Rep., 44, 27: 1595 (July 5), 1929.

Growing Bacteria—A method of growing bacteria in continuous culture was perfected for the production of large quantities of bacterial products. An ingenious apparatus.

MOYER, H. V. A Continuous Method of Culturing Bacteria for Chemical Study, J. Bact., 18, 1: 59 (July), 1929.

Industrial Hygiene—The record of the medical department of a small factory. All employees submitted voluntarily to the offered health examination, and 31 per cent of the discovered defects were corrected within the year.

MURRAY, H. G., and COOLIDGE, E. Health Work in Industry, New England J. Med., 200, 26: 1321 (June 27), 1929.

Reporting Children's Diseases—This supplementary report of the Hagerstown Morbidity Studies indicates that age is an important factor in completeness of reporting of children's diseases. It is suggested that morbidity statistics be used cautiously.

SYDENSTRICKER, E., and HEDRICH, A. W. Completeness of Reporting of Measles, Whooping Cough, and Chickenpox at Different Ages, Pub. Health Rep., 44, 26: 1537 (June 28), 1929.

Seasonal Diphtheria Immunity—The findings of an investigation which the authors believe tends to strengthen the probability that the fundamental factor in seasonal variation in diphtheria is the modification of individual resistance.

PERKINS, R. G., *et al.* Seasonal Variation of Diphtheria Antitoxin Content of the Blood of Adults and Adolescents, Am. J. Hyg., 10, 1: 13 (July), 1929.

Diet for the Aged—This paper should be read not only for the valuable lesson in applied common sense but because of the injection of the human touch—for lack of a better word—into technical writing.

RICE, T. B. A Balanced Ration for the Aged, Pub. Health Nurse, 31, 7: 356 (July), 1929.

Practitioners and Health Education—General practitioners are urged to participate in the health educational campaign in this rather rambling but none the less interesting discourse on public instruction in medicine.

ROBEY, W. H. Public Instruction in Medicine, New England J. Med., 200, 25: 1271 (June 20), 1929.

The Tuberculosis Patient—This appears to be the complete report of the study made to determine how much medical attention the early case of tuberculosis gets. Mention of the findings has been made in earlier papers. The need for periodic examinations of the apparently well is stressed.

WILLIAMS, L. R., and HILL, A. M. A Study of What Tuberculosis Patients Experience Prior to Their Admission to a Sanatorium, New England J. Med., 201, 2: 82 (July 11), 1929.

NEWS FROM THE FIELD

SNAKE BITE SERUM

THE New York State Health Department has distributed throughout the state a limited supply of antivenin serum for use in an emergency. This serum is used in case of bites from rattlesnakes, copperheads and water moccasins.

The supply is available at the State Laboratory at Albany; Bear Mountain headquarters of the Palisades Interstate Park, and at the district laboratory supply stations at Glens Falls, Binghampton and Haverstraw.

The department stated:

> Immediate administration of the serum is urged, and is probably essential, although it is said to be effective if given within from 12 to 24 hours after the bite.

"RABBIT FEVER" RECOGNIZED AS EXISTING IN RUSSIA

PROOF that tularaemia or "rabbit fever" is by no means confined to the United States is given in a report received by the U. S. Public Health Service which indicates the prevalence of the disease in Russia. The full text of a statement by the U. S. Public Health Service dealing with this subject and made public June 22, 1929, follows:

> That tularaemia is by no means confined to the United States is shown by a recent article in a foreign scientific journal which carries abstracts of articles which would indicate that tularaemia is coming to be recognized as existing in Russia. The original articles are by members of the staff of the State Institute of Microscopy and Epidemiology, at Saratov, for the S. E. of the Union of Socialistic Soviet Republics.

INSTITUTE FOR TUBERCULOSIS WORKERS

VANDERBILT University, in cooperation with the National Tuberculosis Association, will conduct an Institute for Tuberculosis Workers from September 10 to 24, 1929, at Nashville, Tenn. The Southern Conference on Tuberculosis, the Tennessee Tuberculosis Association and the Tennessee State Department of Health will also cooperate in this Institute.

> The Institute has four main objectives: to assist workers already in executive positions in the tuberculosis field to assume positions of great responsibility or to become more useful in their present positions; to prepare for executive positions those who have not had experience in the tuberculosis field; to give to volunteer workers a more comprehensive knowledge of the administrative problems involved in this work; to aid in the standardization of methods and programs of tuberculosis work.

MILK

ROME, Naples, Milan, and Verona have established milk centers where all milk intended for consumption in the city is sent for sterilization. At Italy's first conference on milk, held recently in Verona under government auspices, the fact was brought out that the annual consumption of milk per capita in Italy is only 15 quarts, while it is 90 quarts in England, 235 quarts in Germany, and 265 quarts in Sweden.

MENTAL HYGIENE CONGRESS

THE First International Congress on Mental Hygiene will be held in Washington, D. C., May 5 to 10, 1930. Twenty-six countries are already represented on the Committee on Organization, of which Arthur H. Ruggles, M.D., of Providence, R. I., is chairman.

Questions to be discussed at the Congress will include the relations of mental hygiene to law, to hospitals, to education, industry, social work, delinquency,

parenthood and community problems. A world-wide view of mental hygiene progress will be given.

It is the contention of those promoting the Congress that mental hygiene has to do with the conservation of mental health in general, not merely with nervous and mental disorders and diseases.

A NEW HEART LEAFLET

THE importance of physical examinations, the prevention of heart defects, and suggestions about how to live with an impaired heart are all included in a brief leaflet *Your Heart*. This is one of the health leaflet series issued free to health agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Mass.

BROOKLYN, N. Y., BOYCOTTS LOOSE MILK

GRADE B milk in all parts of Brooklyn, N. Y., with the exception of East New York, has recently been boycotted. This was announced by Daniel Gutman, counsel for the Greater New York Grocers' and Dairymen's Protective Association.

SUN-TAN

SHIRLEY W. Wynne, M.D., Commissioner of Health of New York City, warned the people recently, in a speech he gave over the radio, against getting too bad a sunburn for the sake of style. He said:

When a person in the sun gets a peculiar sort of headache, becomes dizzy or nauseated, or notices that his skin is hot and dry, and that he is not perspiring as usual, it means that he must get out of the sun—and get out of it at once. If he pays no attention to these warnings, he will suddenly become unconscious and drop in his tracks.

The treatment in such a case, Dr. Wynne contended, is to call in a doctor, bring down the temperature of the patient by means of ice water, ice packs, cold showers, ice bags and cool sponges. He must rest for several days, avoiding the sun.

COMMONWEALTH FUND

THE Commonwealth Fund, which completed on June 30 a 5-year program for the development of child health services in Austria, announces the adoption of a new plan, to be put in operation on January 1, 1930, to promote rural health and medical service in the United States.

Unlike the Austrian project and the 4 child health demonstrations which the Fund has conducted in North Dakota, Tennessee, Georgia, and Oregon, the new undertaking will not stress child care. Its purpose will be rather to explore the possibility of bettering the whole range of health services in rural communities.

The Fund will center its effort in 2 states, yet to be selected, and in 2 counties or districts in each state where a sound beginning has already been made in local public health organization.

PERSONALS

PROFESSOR THOMAS WALTON GALLOWAY, member of the Division of Educational Measures of the American Social Hygiene Association, died on July 16, in New York, N. Y.

DR. WADE HAMILTON FROST, Surgeon of the U. S. Public Health Service, resigned from the Service. His resignation is effective beginning August 8, 1929.

GEORGE W. BARTELMEZ, Ph.D., has been promoted to a full professorship in anatomy at the University of Chicago, Chicago, Ill.

JACOB T. BUTZ, M.D., health officer of Allentown, Pa., has been elected President of the Pennsylvania Public Health Association.

DR. LESLIE ERNEST FUCHS, of Vienna, Austria, will be awarded the Leslie Dana Gold Medal for 1929, according to an announcement made by Lewis H. Carris of the National Society for the Prevention of Blindness.

DR. CHARLES MAYO, of Rochester, Minn., was awarded the degree of doctor of science, on June 23, at Leeds, England.

DR. JAMES L. MCCARTNEY has been appointed psychiatrist of the Connecticut State Department of Health.

DR. MARION LECOCQ, Lynden, Wash., has been reappointed County Health Officer, to serve a term of 2 years.

ISIDORE S. FALK, Ph.D., has been promoted to a full professorship in hygiene and bacteriology at the University of Chicago, Chicago, Ill.

CONFERENCES

Sept. 26–28, Association of Military Surgeons of the United States, Denver, Colo.

Sept. 30–Oct. 5, American Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, American Child Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, International Society of Medical Health Officers, Minneapolis, Minn.

Sept. 30–Oct. 5, American Association of School Physicians, Minneapolis, Minn.

Sept. 30–Oct. 5, Northwest Conference of Child Health and Parent Education, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Sanitary Conference, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Public Health Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Minnesota State Organization for Public Health Nursing, Minneapolis, Minn.

Sept. 30–Oct. 5, American Social Hygiene Association, Minneapolis, Minn.

Sept. 30–Oct. 5, Conference of State Laboratory Directors, Minneapolis, Minn.

Sept. 30–week, National Safety Council, Chicago, Ill.

Oct. 14–18, American College of Surgeons, Chicago, Ill.

Oct. 21–25, Inter-State Postgraduate Medical Association of North America, Detroit, Mich.

Oct. 24–26, International Association of Milk Dealers, Toronto, Can.

Nov. 4–7, 8th Annual Meeting of the American College of Therapy, Chicago, Ill.

Nov. 11–13, National Society for the Prevention of Blindness, St. Louis, Mo.

Nov. 20–22, Southern Medical Association, Miami, Fla.

FOREIGN

Oct. 16, International Conference for the Revision of International Classification of Causes of Sickness and Death, Paris, France.

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Streptococcus of Septic Sore Throat*

WILLIAM D. FROST, DR. P. H., FELLOW A. P. H. A., R. C. THOMAS, MILDRED GUMM, AND MYRTLE SHAW, PH. D.

Laboratories of Agricultural Bacteriology, University of Wisconsin, Madison, Wis.

SINCE the first great American epidemics, which appeared in Boston in 1911 and Chicago in 1912, septic sore throat has been the subject of vital interest both to public health officials and to milk producers the country over. This is especially true because septic sore throat, even now, is erroneously quite generally regarded as an exclusively milk-borne disease.

Before this disease was recognized in its epidemic form in this country, it was well known in England and the Scandinavian peninsula.

Wherever and whenever the disease has appeared, streptococci have always been recognized as the probable etiological factor, but it was not until the work of Davis[1] in 1912 that a specific streptococcus was incriminated. His bacteriological study of this organism made it clear that the streptococcus of septic sore throat in the epidemics he studied differed in certain quite striking particulars from the hemolytic streptococci commonly found in tonsillitis and various other human infections. The value of Davis's work in thus differentiating the streptococcus of septic sore throat was not immediately recognized; in fact, even recent literature contains statements to the effect that the type of streptococcus may vary in different epidemics.

Brown, Frost and Shaw[2] in 1925 examined, by critical and differential methods, all of the cultures isolated from epidemics of septic sore throat, including the Boston and Chicago ones, so far as they were available. Their conclusions were that all of the various strains

* Read before the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

studied, some 11 in all, were identical so far as their tests showed; and that they corresponded with the organism originally described by Davis and named by him *Streptococcus epidemicus*. They also re-emphasized the fact that this streptococcus differs very strikingly and constantly from *Streptococcus pyogenes* in two major particulars, namely, that *Streptococcus epidemicus* possesses a striking capsule when examined in moist India ink preparations, and that its colonies are large, and moist, and have a tendency to grow on the surface.

DESCRIPTION OF STREPTOCOCCUS EPIDEMICUS

From the work that has been done on this organism[3] it may now be described as a streptococcus growing in short or long chains, surrounded—when viewed in a moist India ink preparation—by a capsule, the entire width of which is, on the average, equal to 3 of the organisms. This capsule, however, is not stained by the ordinary capsule stains.

On poured blood agar plates the colonies reach considerable size in 18 hours, and between 24 and 48 hours present their most characteristic appearance. In general, streptococcus colonies grow below the surface of the medium and are spherical or slightly lenticular in shape. Rarely small, thin colonies appear on the surface. But *Streptococcus epidemicus* colonies characteristically appear as surface colonies. They are large, moist and spreading, and to the uninitiated might not be recognized as streptococcus colonies at all. These surface colonies have a marked tendency to dry down if their incubation is prolonged beyond 48 hours. The deep colonies are large, long and flatly lenticular.

The colonies on a standard blood agar plate are strongly hemolytic, producing a clear hemolyzed area in from 24 to 48 hours, from 2.5 to 3.0 mm. in diameter. Twenty-four hours later this area may be nearly doubled in size.

In fluid mediums it produces complete hemolysis in 2 hours when tested by the U. S. Army method.[4]

When inoculated intraperitoneally with ½ c.c. of a 24-hour serum broth culture, it kills mice in from 7 to 48 hours.

This organism ferments dextrose, lactose, saccharose, and salicin, but not mannite. In dextrose broth it produces a pH not lower than 4.8. It does not ferment inulin or raffinose and is not bile soluble, but these tests probably have little or no value in differentiating streptococci. The same is true of cultures in broth and milk. This organism does not hydrolyze sodium hippurate as many of the bovine strains do.

THE CLINICAL ASPECTS OF SEPTIC SORE THROAT

It should, we think, be emphasized that this is a distinct disease, which etiologically, clinically and pathologically can be recognized as an entity; that public health officials should recognize it as a distinct communicable and reportable disease and urge the physicians in their constituencies to take the possibility of this disease into consideration when they are called to treat cases of severe sore throat, especially in adults, and also to bear in mind the possibility of confusing this disease with atypical cases of scarlet fever and influenza. It seems certain that sporadic cases of septic sore throat frequently and continuously exist. So far as we are aware, there is no literature on this phase of the subject.

EPIDEMICS OF SEPTIC SORE THROAT

From 1880 to 1905 there were described 18 epidemics in England, 1 in Norway in 1908, and, since the first epidemic in this country at Cambridge, Mass., in 1908, 52 in the United States reported as being milk-borne.[5, 6] One hospital epidemic has been described as being spread by contact,[7] and recent reports from the Massachusetts State Board of Health[8] have recognized an increasing number of cases of septic sore throat not milk-borne.

In the light of our present knowledge, the causal relationship of milk to streptococcic sore throat has been satisfactorily demonstrated in comparatively few American epidemics, although there is little reason to doubt that, if what we now regard as the proper bacteriological methods had been used in their study, the epidemiological relationships would have been made clear in most if not all of them.

ETIOLOGICAL RELATIONSHIPS

There are commonly found in milk, pasteurized as well as raw, streptococci which upon a cursory examination might be confused with the etiological agent of this disease. It is even now a common practice in medical literature to refer to all hemolytic streptococci as *Streptococcus hemolyticus* on the supposition that they are all the same. As very clearly pointed out in his admirable monograph on the use of blood agar for the study of streptococci, J. Howard Brown makes it clear that hemolysis is a property common to very different streptococci, which may be separated into several quite distinct types or species. Unless, then, in the discussion of any epidemic of septic sore throat it is actually shown that *Streptococcus epidemicus* is present, the investigations have little value.

The presence of hemolytic streptococci in raw milk, in interepi-

demic periods, has been studied by a number of investigators. Davis,[9] for example, found hemolytic streptococci in 85 out of 328 samples, or approximately 26 per cent of those examined. Ayers and Mudge[10] isolated streptococci from 38 per cent of the cows examined by them, but did not indicate their action on blood. Frost and Bachmann[11] examined individual samples from 412 cows and found hemolytic streptococci of the beta type in 28 per cent of them. The mere presence of hemolytic streptococci in milk can have no significance in the epidemiology of septic sore throat, since they are always found in high grade raw milk; frequently found in pasteurized milk; and we believe they are quite as common in the poorer grades of raw milk, although there is considerable difficulty in demonstrating them due to the fact that other bacteria present make it necessary to dilute the sample far beyond that point which is ordinarily used in demonstrating them in the better grades of milk.

In the investigations of many of the past epidemics of septic sore throat, the finding of a cow suffering from streptococcic mammitis has been taken as sufficient evidence of the fact that the milk from such a cow was the cause of the epidemic, but we believe that there is no evidence that ordinary bovine mastitis is the cause of septic sore throat—or any human disease for that matter. The cause of mastitis in cattle is not always streptococci, but, even when it is, these are very rarely of the "epidemicus" type, and hence cannot be the cause of the disease. Furthermore, mastitis in cattle is such a common disease that it would be difficult to associate septic sore throat, which occurs so rarely, with this disease in cattle, which is so commonly and universally present.

To account for milk-borne septic sore throat, it is necessary to assume that the causal organism is present in the particular milk in quantities sufficient to infect.

It is quite evident that this organism may enter the milk in two ways. It may get into the milk from the milker or others who handle it, after it is drawn from the cow, or it may come directly from cows suffering from a mastitis caused by *Streptococcus epidemicus*, or from cows which are, at least, carriers of this organism. The relative importance of the probable source of this organism in milk has been ably discussed by previous workers, especially Smith and Brown,[12] in which they come to the conclusion:

> The grafting of human streptococci upon the udder, their multiplication under ideal conditions in the warm fresh residual milk, and their discharge twice daily into the milk at milking time, offers a much better explanation of the continuance of milk-borne epidemics over a number of days than any single infection of the

milk through coughing, sneezing, spitting, and tasting. Such accidents may indeed infect the milk, but the infection could hardly last over a day and might be diluted to ineffectiveness in a very large supply. Such accidents would be more potent in a very small dairy.

We may add that such accidents could not logically be thought of as the cause of large epidemics.

"EPIDEMICUS COWS"

For a period of about 4 years the authors have been taking regular monthly samples from the 8 herds (about 1,200 cows), supplying the Chicago district with certified milk, and typing the streptococci in an effort to determine whether *Streptococcus epidemicus* was present, and, if so, its source. Our method of procedure has been to milk a string of 10 cows into a 2-ounce bottle. In doing so, we have discarded the first stream of milk from each quarter and collected the second. These samples have been iced and sent to the laboratory as soon as possible. From the more distant farms this has sometimes been an overnight journey. Each composite sample has been diluted 1 to 20 and plated in veal infusion agar to which 7 per cent of defibrinated horse blood has been added. The incubation temperature has been 37° C. and the time from 18 to 48 hours. If suspected streptococci are found in any of these composite samples, samples from the individual cows composing the string in question are taken and examined by the same routine.

It has been found that streptococci which give a beta zone of hemolysis are very common in these samples, and under the old term would have been regarded as *Streptococcus hemolyticus*. By applying the various tests mentioned in the description of *Streptococcus epidemicus* above, it has been found that there are 4 types or species into which these beta hemolytic streptococci can be classified. In the order of the frequency with which they occur they are: *Streptococcus mastitidis, Streptococcus infrequens, Streptococcus asalignus,* and a small unnamed group differing only slightly from the last. None of these streptococci would be readily confused with *Streptococcus epidemicus.* They are without doubt of bovine origin and are apparently only infrequently connected with mastitic disturbances. They appear to live on the milk rather than on the tissue of the udder.

We have occasionally found *Streptococcus epidemicus* in our group samples, and have been able to identify the cows shedding them. In all we have seen and studied more or less completely 17 cows. Eight of these were found in certified milk herds supplying the Chicago district; 2 were found in connection with an epidemic of septic sore throat (Frost and Carr[15]); and the other 7 were discovered from time to time

as samples of milk were referred to us from the Veterinary Science Department of the University of Wisconsin. In the 8 cows found on the certified milk farms 1 was suffering from a clinical mastitis at the time of discovery and 2 others, which were under study a considerable period of time, later developed pathological conditions which would probably have been recognized by a clinical examination. It is very evident from our work that by means of this monthly examination we are able to pick out cows which may be shedding *Streptococcus epidemicus* in large numbers, which would not have been excluded from the herd, for a considerable time at least, by even the most careful clinical examination. In most of these "epidemicus" cows, there was such a slight abnormality in the udder and the milk that it had escaped the attention of the milkers even though a stripping cup was used.

So far as the 8 cows of the certified milk herds were concerned, they had all recently been brought to the farms, and we have no knowledge of how they became infected. We were unable to obtain any data on the 7 other cows, but the 2 concerned with a small epidemic of septic sore throat were associated with a milker in whose throat we found *Streptococcus epidemicus.*

In regard to the quarters infected, in 4 of the 17 it was undetermined; in 7, only one quarter; in 4, two quarters; and in 2, three quarters of the udder were infected.

We have gone on the supposition that the source of infection was from man, and since Davis has shown that in his experimental work an injury to the udder tissue was necessary for infection, it was interesting to note that a considerable number of these cows had either sores or scars on their teats or udders.

EXAMINATION OF EMPLOYEES' THROATS

To guard against the possibility of cows becoming infected on the certified milk farms, as well as to protect the milk from infected handlers, a monthly examination of throat swabs from the employees on all the farms in the Chicago district for *Streptococcus epidemicus* has been carried on simultaneously with the examination of the milk samples. The examinations are made in the same way. The swabs are covered with about 2 c.c. of veal infusion broth, either at the farm or as soon as they are received at the laboratory. In the latter case they are incubated for about 2 hours, and then a single loop of this broth is introduced into a tube of fluid blood agar and poured into petri dishes, so that we are able to get the same poured plates as in the milk samples.

The results obtained during the first 2 years were reported by Dr.

Clarence C. Saelhof.[14] During the latter half of the period covering 20 months, 1,996 cultures have been examined from 438 different men. Of these about one-fourth, or 115 men, were carrying streptococci which gave beta hemolytic colonies. Fourty-four men gave these cultures with such regularity that they might be considered as carriers. The remaining 72 gave positive results only occasionally.

There have been 7 different types of beta hemolytic streptococci found: *Streptococcus pyogenes* in 66 men, *Streptococcus anginosus* in 35, *Streptococcus mastitidis* in 17, *Streptococcus equi* in 8, *Streptococcus subacidus* in 7, *Streptococcus infrequens* in 6, and *Streptococcus epidemicus* in 6.

Streptococcus epidemicus has been identified in the throats of 3 men by Saelhof and in 6 by us. In only 1 man, however, has it been possible to obtain more than the first culture because, with this 1 exception, the men have left the farm upon hearing of the results. In the 1 case mentioned we were able to get several cultures. He was immediately sent off the farm and visited by a physician who made the cultures. He had a clinical sore throat but it was never diagnosed as septic sore throat. After recovery, his tonsils were removed and later several cultures were made which were all negative. He was allowed to return to the farm, but was observed on two occasions going to his room when the doctor visited the farm for the purpose of making swabs and gargling his throat. For this attempted evasion of an examination, he was promptly discharged, but soon reappeared on another of our certified milk farms, in another state. Two examinations from him at this place were negative, but as soon as his identity was discovered, he was again discharged. We have never found *Streptococcus epidemicus* in the milk of either of the farms where this man worked, nor have we ever found "epidemicus cows" on the farms where *Streptococcus epidemicus* has been found in the throats, with 2 exceptions, where the cultures from the throats were obtained a year or more after the infected cows were found.

HOW SAFE DO THESE TESTS MAKE RAW MILK?

The facts determined in these investigations suggest that the methods proposed, largely by Brown and his coworkers, enable us to differentiate human hemolytic streptocci of the beta type from those commonly found in milk.

The *Streptococcus epidemicus* cultures which we have occasionally found in milk correspond in all particulars with the cultures of this organism from the various human epidemics from which cultures are available.

These cultures of *Streptococcus epidemicus* have always been traced to particular cows which we were able to identify promptly and remove. So far as our evidence goes, these cows have always been infected with this organism, and were not merely furnishing in the milk cistern of the udder the culture medium. They have been found in all stages of infection. On the certified milk farms we have always detected them in the early stages, and 6 of the 8, when first found, showed no clinical symptoms of mastitis or detectable changes in the fresh milk, but such of these cows as we have been able to study have later developed mastitis which led to profound tissue changes. It would seem that cows suffering from an infection with a human streptococcus are not by any means rare, at least in certain dairy sections of the country. There may be, for example, a large number of these cows in the dairy regions of Massachusetts, New York and Connecticut, where 41 of the 52 epidemics of septic sore throat in this country have appeared, while only 3 have been reported from Illinois, 2 each from Vermont and Wisconsin, and 1 each from Maryland, New Hampshire, Oregon and Pennsylvania.

Granting that our method of examination is as satisfactory as it appears to be in our hands, and granting that certified milk farms do not introduce cows into their milking lines unless they have been shown to be free from infections with *Streptococcus epidemicus,* or carriers of this organism, and granting further that by throat examinations of the milkers and dairy employees to be sure that they are not harboring this organism, and providing that the milk from individual cows or small groups be examined on blood agar plates at frequent intervals to detect dormant carriers, it would seem that the danger of milk-borne septic sore throat could be eliminated from such milk with a high degree of certainty.

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Effect of Broken Home on Quality of School Work

IN a study of 4,000 public school children in Germany, most of them 10 to 14 years old, the author, who some time ago made a study of the effect of economic condition on the quality of school work, concludes that the absence of one or both parents has an unfavorable effect on the child's school work.

The author finds that retardation, that is, failure to be promoted, is 50 per cent more frequent among children from incomplete families than among children from normal families. (An incomplete family is one that has been disrupted by the death of one or both parents or by divorce, or in which the mother is unmarried.) Particularly bad was the situation among children who had lost their fathers, among whom retardation was 70 per cent more frequent than among children having both parents.

In seeking the causes of this situation the author takes up the relative importance of inherited physical or mental inferiority and unfavorable environment in different types of cases. He is of the opinion that among children one or both of whose parents died at an early age inherited physical inferiority probably was a factor in the retardation. He thinks that inherited mental inferiority may have been present in the children of unmarried mothers, particularly when the mother had more than one child of illegitimate birth, and that children of divorced parents may have inherited certain defects that were responsible for the divorce of the parents. He finds that in every case lack of proper supervision, due to the absence of one or both parents, had affected the quality of the child's school work.—*Zeitschrift für Kinderforschung*, Berlin, 33, May 22, 1929, p. 517.

Endemic Goiter in Louisville and Jefferson County Schools

With Evidence of Family History, Defective Teeth, Tonsils, Chest Expansion, and Use of Iodized Salt

W. O. JOHNSON, M. D., F. A. C. S.
Louisville, Ky.

AMONG the profession as well as the laity, there seems to be an impression that endemic goiter is relatively infrequent in Kentucky, especially in the lowland counties, and that, when found, it is in families that have moved into those counties from goitrous belts.

In order to obtain some facts about the prevalence of endemic goiter in Louisville, Ky., a survey was made of the girls in Louisville city high schools and 8th grades, and of both boys and girls between 10 and 19 years of age in 9 schools in Jefferson County. Among a total of 5,083, there were found 677 cases of goiter; that is, 13.32 per cent of all examined had adolescent goiter. The work was done between February 1 and May 1, 1928.

All examinations were made by the same person in order that the findings might be comparable to others, and according to standards used by Olesen and Kimball. The goiters were recorded: very slight, slight, medium–large, and adenoma, following the classification by Kimball in the Akron survey. The usual methods of inspection and palpation were employed.

TABLE I

TYPES OF GOITERS

Types	City		County		Combined Total	
	Number	Per cent of all cases	Number	Per cent of all cases	Number	Per cent of all cases
Very slight	210	34.6	7	10.0	217	32.0
Slight	356	58.7	56	80.0	412	60.9
Medium–Large	29	4.8	4	5.7	33	4.9
Adenoma	12	1.9	3	4.3	15	2.2
Totals	607	100.0	70	100.0	677	100.0

Table I gives percentages based on the total number of cases examined in each separate group, for both city and county.

In this table it is interesting to note, 21.3 per cent greater incidence of slight adolescent or typical diffusely enlarged goiter in the county than in the city, and 2.4 per cent greater incidence of adenomata in the county. This may lead one to infer that either the type of life in the country has an effect, or that there is a greater familial incidence of goiter among the county cases than the city.

If there is a familial tendency, let us see if those that have goiters come from goitrous families or from goitrous districts.

TABLE II

RESIDENTS BORN OUT OF STATE

Type	City			County			Combined Totals		
	Born in the State	Born out of State	Total	Born in the State	Born out of State	Total	Born in the State	Born out of State	Total
Goiter.....	534	73	607	64	6	70	598	79	677
Per cent..	88.0%	12.0%	100.0%	91.4%	8.6%	100.0%	88.3%	11.7%	100.0%
Non-Goiter..	3,188	537	3,725	613	68	681	3,801	605	4,406
Per cent..	85.6%	14.4%	100.0%	90.0%	10.0%	100.0%	86.3%	13.7%	100.0%
Total cases..	3,722	610	4,332	677	74	751	4,399	684	5,083

There are 2.0 per cent more non-goiters born out of the state than goiter cases, while 3.4 per cent more goiter cases in the city were born out of the state than in the county.

It is interesting to note that 90 per cent of the goiter cases who were born out of the state and later moved into Kentucky were born in Indiana and Tennessee, which states are out of the goiter belts; while only 67 per cent of the non-goiters came from these states. This shows that cases of goiter found here arise, not from those who have lived in goitrous belts, but from native born families.

Table III clearly demonstrates the familial relationship of goiter; 22.1 per cent of the cases having a goiter gave a family history of goiter. Of these, in 60 per cent the mother had a goiter, and in 20 per cent a sister. Only 7.4 per cent of the non-goiters gave a family history of goiter, the mother being affected in but 46 per cent of this group. The family history of goiter is 10.4 per cent higher in the county schools than in the city schools. This throws some light on the findings in Table I, in which it appears that despite a more open air life and better hygiene in the country, there is a greater percent-

TABLE III

FAMILY HISTORY OF GOITER

Relative	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Mother	126	47.0	77	60.1	24	41.4	13	59.1	150	46.0	90	60.0
Father	9	3.4	4	3.1	3	5.2	.....	.....	12	3.6	4	2.6
Sister	54	20.1	26	20.3	14	24.1	4	18.2	68	20.8	30	20.0
Aunt	43	16.1	20	15.7	9	15.5	1	4.5	52	16.0	21	14.0
Grandmother	24	9.0	1	0.8	2	3.5	2	9.1	26	8.0	3	2.0
Cousin	10	3.7	.....	.....	1	1.7	1	4.5	11	3.4	1	0.7
Brother	2	0.7	.....	.....	5	8.6	1	4.6	7	2.2	1	0.7
Totals	268	100.0	128	100.0	58	100.0	22	100.0	326	100.0	150	100.0
Percentages	7.1		21.0		8.5		31.4		7.4		22.1	

age of adenoma and definite adolescent goiter. Also, the familial relationship is greater in the county schools.

In this climate the average age for the beginning of menstruation is 13 years. It is before or about this time that adolescent goiter usually appears; in the goitrous district it appears much earlier.

TABLE IV

AGE INCIDENCE

Age	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
10	21	0.6	.....	.....	126	18.5	9	12.9	147	3.3	9	1.3
11	59	1.6	5	0.8	106	15.5	9	12.9	165	3.7	14	2.1
12	304	8.2	27	4.5	141	20.7	14	20.0	445	10.1	41	6.1
13	560	15.0	88	14.5	94	13.8	15	21.4	654	14.8	103	15.2
14	854	22.9	131	21.6	94	13.8	11	15.7	948	21.5	142	20.9
15	888	23.8	151	24.9	63	9.3	7	10.0	951	21.7	158	23.4
16	602	16.2	117	19.2	47	6.9	4	5.7	649	14.7	121	17.8
17	349	9.4	63	10.4	10	1.5	1	1.4	359	8.2	64	9.5
18	78	2.0	17	2.8	.....	.....	.....	.....	78	1.8	17	2.5
19	10	0.3	8	1.3	.....	.....	.....	.....	10	0.2	8	1.2
Total	3,725	100.0	607	100.0	681	100.0	70	100.0	4,406	100.0	677	100.0

Table IV shows that in the city 24.9 per cent of the goiters were found at age 15 years, which is later than the average beginning of adolescence in this climate, while in the county 21.4 per cent were found at the age of 13. There were 12.9 per cent more goiters found in the county at 10 years of age than in the city. None were found in the city at this age. The more rapid physical development of the country children may explain the earlier development of goiter in this group.

TABLE V

WEIGHT INCIDENCE

	City				County			
	Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Normals	1,499	40.3	250	41.1	339	49.8	23	32.9
7–10% Underweight	386	10.4	61	10.4	86	12.6	14	20.0
10–20% Underweight	902	24.3	155	25.4	141	20.7	22	31.4
Over 20% Underweight	186	4.9	56	9.2	20	2.9	4	5.7
7–10% Overweight	165	4.4	27	4.4	33	4.9	1	1.4
10–20% Overweight	344	9.2	31	5.1	40	5.9	4	5.7
Over 20% Overweight	243	6.5	27	4.4	22	3.2	2	2.9
Totals	3,725	100.0	607	100.0	681	100.0	70	100.0

Children from 7 per cent overweight to 7 per cent underweight were considered within the normal zone. Only 40 per cent of those examined were within this zone, the group being about equally divided between the goiters and non-goiters. However, in the county schools, there were 16.9 per cent more non-goitrous children within the normal group than goiter cases.

The significant point is that in the city there were 4.3 per cent more goiter cases in the over 20 per cent undernourished group than non-goiter cases. In the county the ratio of goiters to non-goiters in the undernourished group is more pronounced. The greatest number of overnourished children were in the non-goiter group.

Dental conditions were classified as to tartar; tartar and cavities; and tartar, cavities and gingivitis; or extreme dental neglect.

The presence of dental decay does not necessarily imply focal infection, but it is reasonable to assume that focuses of infection are more possible with poor teeth than with good and well cared for teeth.

TABLE VI

TEETH

Dental Conditions	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Tartar	833	63.0	202	61.7	178	57.8	26	70.3	1,011	62.0	228	62.4
T-Cavities	420	31.7	107	32.6	123	39.9	11	29.7	543	33.3	118	32.3
T-Gingivitis	68	5.3	19	5.7	7	2.3	.....	.....	75	4.7	19	5.3
Totals	1,321	100.0	328	100.0	308	100.0	37	100.0	1,629	100.0	365	100.0
Percentages	35.4		48.4		45.2		52.8		36.9		53.9	

Missing and filled teeth were not classified because of insufficient time, but one may assume that the usual reason why teeth were filled or removed was that they had been points of disturbance, though these steps may have been taken before systemic infection started. Missing teeth were more probably a cause of infection than filled teeth, for teeth are usually removed when they cannot be properly filled. These points as possible causes of thyroid enlargement will be discussed later.

There were 13 per cent more dental disorders among the goiters than among the non-goiters in the city, with only a 7.6 per cent greater number of dental defects between the two classes in the county. There were 9.7 per cent fewer dental defects among the goiters in the

TABLE VII

TONSILS

	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Out	1,133	30.5	144	23.8	174	25.5	27	38.7	1,307	29.6	171	25.4
Submerged	980	26.3	141	23.3	139	20.4	9	12.9	1,119	25.4	150	22.1
Medium	1,115	29.9	206	33.9	288	42.3	25	35.5	1,403	31.8	231	34.1
Large	497	13.3	116	19.0	80	11.8	9	12.9	577	13.2	125	18.4
Totals	3,725	100.0	607	100.0	681	100.0	70	100.0	4,406	100.0	677	100.0

city than in the county. Can one explain this difference in the dental hygiene as due to more close attention to health habits in the city schools?

As only the girls were examined in the city, no comparison could be made there; but in the county the dental hygiene among the boys was 4 per cent higher than among the corresponding number of girls. The cases with larger goiters had the most extreme grades of dental neglect.

Tonsils are usually removed because of suspected or existing disease, and while enlarged tonsils do not necessarily indicate a source of infection, yet some of the enlargements may be the result of infections.

The classification of tonsils as: out, submerged, medium, and large, is to indicate degrees of hypertrophy, and not to infer that they are focuses of infection.

TABLE VIII

CHEST EXPANSION

Inches expansion	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	24	0.06	3	0.04	9	1.5	4	0.07	33	0.7	7	1.0
1½	189	5.0	49	8.9	70	10.27	11	16.9	259	5.8	60	8.8
2	928	24.9	146	24.0	218	32.0	21	31.5	1,146	26.0	167	24.6
2½	772	20.9	130	21.7	92	13.6	12	19.8	864	19.7	142	20.9
3	1,134	30.6	164	27.0	186	27.4	17	25.8	1,320	29.9	181	26.9
3½	384	10.5	60	9.9	48	7.3	4	5.9	432	9.8	64	9.6
4	241	6.5	38	6.5	55	7.9	1	0.03	296	6.8	39	5.7
4½	39	1.5	12	1.9	3	0.03	.....	.....	42	0.9	12	1.8
5	14	0.04	5	0.06	.....	.....	.....	.....	14	0.4	5	0.7
Totals....	3,725	100.0	607	100.0	681	100.0	70	100.0	4,406	100.0	677	100.0

There were 5.7 per cent more large cryptic tonsils among the goiters than among the non-goiters in the city, and only 1 per cent more large cryptic tonsils among the county goiter cases. The larger goiters were predominantly associated with large cryptic tonsils, and also the more severe grades of dental neglect. This association was a very striking feature throughout the survey.

In the city there were 4.3 per cent more tonsillectomies among the non-goiters than goiters, and 14.6 per cent more tonsillectomies in the

county goiter patients than the city school children. The removal of tonsils opens a large field for discussion as to whether the goiter is a result of preëxisting disease, or has occurred after tonsillectomy as a coincidence.

The chest expansion was measured one inch below the nipple line and a mean of two expansions taken.

The average chest expansion for the group is 2½ inches, slightly less than 1 inch less in goiter cases, in comparison to non-goiters. The chest expansion of county cases was not so great as of city cases, probably because of the difference in the mode of teaching and exercise; nevertheless the chest expansion of goiter cases was about 1 inch less than the non-goiter cases.

The use and non-use of iodized salt was recorded, for it has been advocated by some as a prophylactic.

TABLE IX

IODIZED SALT

	City				County				Combined Total			
	Non-Goiter		Goiter		Non-Goiter		Goiter		Non-Goiter		Goiter	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Yes.....	2,289	61.5	391	64.4	281	41.3	31	44.3	2,570	58.3	422	62.3
No.....	1,076	28.8	183	30.2	349	51.2	36	51.4	1,425	32.3	219	32.3
?.....	360	9.7	33	5.4	51	7.5	3	4.3	411	9.4	36	5.4
Total....	3,725	100.0	607	100.0	681	100.0	70	100.0	4,406	100.0	677	100.0

In the city 3 per cent more goiter than non-goiter cases were using iodized salt, and still there were 13.31 per cent goiters present. This is a greater incidence than was reported in a partial survey by Dr. L. K. Baldauf in 1925, in which approximately 7 per cent of goiter incidence was found.

There was 20 per cent less iodized salt used in the county than in the city, with 5.4 per cent fewer goiters in the county. This difference is not explained alone by the better hygienic life of the country child.

It seems from Table IX that iodized salt used as a prophylactic for adolescent goiters is only a mean of increasing sales of grocers' commodities to the credulous public when in reality it has not been proved to be of sufficient value to be called a prophylactic agent.

SUMMARY

A survey of 5,083 girls of Louisville city high schools and 8th grades, and boys and girls of 9 county schools, with 677 or 13.31 per cent adolescent goiter cases, found a predominance of adenoma and typical adolescent goiters in the county, with 10 per cent higher family incidence of goiter where, in spite of open, hygienic life, goiters develop when the family incidence is high.

These adolescent goiters came from local stock, and not from families of goitrous districts.

The family history is 14 per cent higher among goiters than non-goiters, and 20 per cent higher among the mothers of goitrous patients than non-goitrous, the condition appearing in mothers in 60 per cent and in sisters in 20 per cent of the cases.

The age predominance in Kentucky for adolescent goiter is somewhat higher than the beginning of adolescence, being on an average 14.6 years, and the county school children 1 year earlier.

Teeth without decay were more frequently found among non-goitrous children in both county and city. The county cases had slightly better dental hygiene than the city cases.

The extreme grades of dental neglect were more often found among those having the larger goiters.

Large cryptic tonsils were more often found among the goiter cases, and a greater number of non-goitrous children had had tonsillectomies than goiter cases.

Chest expansion of those with goiter averaged 1 inch less than those without.

Use of iodized salt was greater in the city, where goiter was 5.4 per cent higher than in the county where 20 per cent less iodized salt was used. Iodized salt does not seem to be efficient as a prophylactic.

COMMENT

From the above material it appears that goiters occurred more commonly among the undernourished children who had, to a greater extent, slight or markedly decayed teeth, as well as hypertrophied and cryptic tonsils, and with a chest expansion less than those with no goiter. These children were using 3 per cent more iodized salt to prevent goiter, but showed a greater incidence of goiter than the non-salt-users.

From the foregoing it appears that for the prevention of adolescent goiter more is necessary than the indiscriminate use of iodized salt.

We need a better public understanding of the problem, together with the institution of health habits, education, and individualized supervision of these adolescent goiter patients, not only for their better health but for the better health of future generations.

Contact Carriers in Meningitis*

JOHN F. NORTON, PH. D., FELLOW A. P. H. A.

Department of Health, Detroit, Mich.

IT is generally conceded that cerebrospinal fever (epidemic or meningococcic meningitis) is spread largely by healthy carriers. The control of the disease therefore depends upon the control of carriers. Measures leading to this end have been instituted under military conditions at various times in this country, in England, and in France. No attempt seems to have been made to control the movements of meningococcic carriers in a civilian population over any considerable period of time.

The number of cases of epidemic meningitis reported to the Department of Health in Detroit during the autumn of 1928 was unusually large.† In January, 1929, 66 cases (with 35 deaths) were reported as compared to an average of 3 for January of the 5 previous years. It appeared certain that an epidemic was in progress. Accordingly, the Commissioner of Health issued an order effective February 1, 1929, requiring the isolation of home contacts for a period of 14 days only, or until two consecutive nasopharyngeal cultures, taken not less than 24 hours apart, were found to be free from meningococci. Persons actually living in the apartment or house at the time the case was diagnosed as epidemic meningitis were considered contacts. In a few instances intimate or casual friends, who had been with the individual just before the illness began, have voluntarily requested that cultures be taken; but such persons when proved to be carriers were not officially isolated.

This report summarizes the experience in Detroit during the 6 months ending July 31, 1929.

Most of the cultures were taken by Department of Health nurses who were assigned to this work and carefully instructed. Some contacts came to the laboratory, but such a procedure was discouraged, particularly when street cars were used as means of transit. The cultures were taken from the nasopharynx with a swab on the end of a bent aluminum wire. The swab was then inserted in a sterile tube and placed in a towel between two warm water bags. Several calls

* Read before the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

† A complete report on epidemic meningitis in Detroit in 1928–1929 is in preparation and will be published later.

were made by each nurse before returning to the laboratory, and the warm water bags were refilled at each house. Upon reaching the laboratory the tubes containing the swabs were placed in an incubator and plated as soon as practicable.

The method described is not ideal, as is shown by the fact that about one swab out of seven failed to give growth on the culture medium, whereas when plates are inoculated immediately after taking material from the nasopharynx it is rare not to obtain growth of some organisms. We were unable to account satisfactorily for the difficulty. Addition of a little sterile distilled water to the tube containing the swab failed to correct this, so that drying of material was evidently not the cause. It was also found that frequently no growths were obtained from the cultures from persons who had recently gargled or were in the habit of using snuff or chewing tobacco. However, there were many more "no growths" reported than seemed desirable. Such a report was not regarded as a negative result for meningococci, and another culture was taken.

The medium used for growing the organisms was that generally recommended—meat infusion peptone agar of pH 7.6, containing 1 to 2 per cent of dextrose and 5 per cent of defibrinated sheep's blood. Plates were incubated not less than 18 hours before examination. Suspicious looking colonies were examined by means of smears stained by Gram's method, and when Gram negative organisms resembling meningococci were found an agglutination test was made. This was done by fishing suspicious looking colonies and suspending the organisms in 0.5 c.c. of salt solution (0.8% NaCl). Amounts of 0.05 c.c., 0.025 c.c. and 0.01 c.c. of a 1:4 dilution of diagnostic antimeningococcic polyvalent serum were placed respectively in three tubes, and to each was added 0.1 c.c. of the suspension of organisms. A control tube was also prepared.

The tubes were shaken for 2 minutes, incubated at 37° C. for 1 hour, and immediately read. The amounts of serum used for the tests were respectively 0.0125, 0.00625 and 0.0025 c.c. Positive results were reported only when agglutination was obtained in the tube containing the smallest amount of serum (0.0025 c.c.) and the control negative.

The possibility of agglutination by normal horse serum was considered. A series of tests showed that some horse serums agglutinated meningococci in amounts of 0.01 c.c., but not in 0.0025 c.c. Three of the serums tested failed to agglutinate in a 1:10 dilution. Pooled serums behaved as might have been expected from the results with single serums.

We believe our technic has been similar to that used by others. Our aim was to obtain accurate results in as short a time as possible. It was necessary to release contacts negative for meningococci as soon as practicable. Twenty-four hours from taking the culture was as short a time as could be allowed for suitable reports.

From February 6 to July 31, 1929, 2,892 contacts with 619 cases were investigated, or an average of 4.67 contacts per case. For purposes of discussion the time is divided into 3 periods: February 6–March 31, April 1–June 1, and June 2–July 31. During the first period cultures were taken from 709 home contacts with 131 cases; 332 persons, or 46.8 per cent, gave one or more cultures positive for meningococci. During the second period cultures were taken from 1,406 home contacts with 310 cases; 207 persons, or 14.7 per cent, gave one or more cultures positive for meningococci. During the third period cultures were taken from 777 contacts with 178 cases, and 23, or 2.96 per cent, were found positive for meningococci one or more times. The percentage of positive contacts by weeks varied from 0.0 during the weeks ending June 23 and July 31, to 65.6 per cent for the week ending February 17.

The high percentage of carriers found during February, March and the first half of April is in striking contrast to many reports found in the literature dealing with military outbreaks of cerebrospinal fever; but is in agreement with figures given by Ostermann and by Bruns & Hohn, as quoted by Frost,[1] for examination of home contacts. It should be emphasized that we were taking cultures only from persons who had been in rather intimate contact with patients.

Unfortunately, we were unable to obtain cultures from any large number of persons who gave no history of contact with meningitis cases. However, during April, 117 non-contacts were studied and 5, or 4.3 per cent, were positive for meningococci. Of 619 contacts during this same month 146, or 23.6 per cent, gave positive cultures. In July, no carriers were found among 169 non-contacts, while 8 carriers were located among 335 known contacts. Only one culture was made from each non-contact. As will be pointed out below this probably involves some error.

It is obvious that, as warm weather approached, the number of contact carriers diminished. The percentage of positives dropped markedly about 4 weeks before the peak of the epidemic, as indicated by the weekly reports of cases, was reached.

It was necessary to obtain more than one culture from a contact in order not to miss a considerable number of carriers. Of the 332 carriers detected during the period February 6–March 31, 236 gave

cultures positive for meningococci at the first examination; 89 were positive at the second examination after being negative at the first; 6 were positive after two negative cultures; and 1 gave meningococci after three unsuccessful attempts. With only one examination we would have missed nearly 30 per cent of our carriers.

By grouping the carriers according to age and sex, an effort has been made to determine the effect of these factors on the carrier state. Only the figures for the first two periods (February 6–March 31, and April 1–June 1) were used, since the number of carriers in the third period was too small for statistical purposes. Among 2,115 contacts, 1,091 were male and 1,024 female. Of the males 25.6 per cent were carriers (i.e., gave one or more positive cultures), and of females 25.4 per cent. Age appeared to have no influence on the carrier state. For example, 12.4 per cent of contacts were in the 5–9 age group, while 14.8 per cent of carriers were in this group. Fifty-eight and nine tenths per cent of the contacts were 20 years old and above, while 56.8 per cent of the carriers fell in this age group. The percentage of carriers to total contacts in each age group was slightly higher for the 1–4 and 5–9 ages, but the differences were too small to be of real significance.

Crowding is supposed to be a factor in meningitis. Presumably, in a civil population we would expect to find a higher percentage of carriers in crowded rooming houses than in residential districts containing 5 or less persons to a home. The 131 cases investigated between February 6 and March 31 were grouped on the basis of number of contacts per case. In the group with 4 or less contacts per case there were 51 cases and 157 contacts, of whom 64, or 40.7 per cent, were carriers. In the group with 5 to 9 contacts per case there were 71 cases and 446 contacts, of which 211, or 47.2 per cent, were positive. The final group, with 10 or more contacts per case, was composed of 9 cases and 106 contacts, of which 57, or 53.7 per cent, were carriers. These figures indicate a somewhat greater tendency for carriers to be found in the more crowded houses. However, the figures for the second period (April 1–June 1) show just the reverse, being 15.2, 15.2, and 11.9 per cent for the three groups respectively.

The persistence of carriers is a point of some importance. We were able to follow most of our carriers for 2 weeks but no longer, since that time was fixed in our isolation regulations. Again using the three divisions of the 6 months' study—in the first period 32.8 per cent of carriers had not given two consecutive negatives before release, in the second period 25.6 per cent, and in the third period 30.4 per cent had not satisfactorily cleared up. While the advent of warm weather

was coincident with a great decrease in the number of carriers, proportionately the tendency to persist was about the same.

It is necessary to stress the uncertainty of obtaining accurate results in the detection of meningococcic carriers. We have had many experiences which convince us that conclusions from our laboratory data must be drawn with care. Either the carrier state is an intermittent one or our technic is not sufficiently exact—possibly both. Sometimes inconsistent results can be explained, but at other times not. One of our contacts gave the following results for meningococci, —, +, —, —, and accordingly was released. One week later she was sent to the laboratory by her physician because he found that she had been using a gargle during the time the last two negatives* were obtained. The next four examinations gave +, +, —, —. One month later she was still negative. This is by no means an isolated instance.

SUMMARY

This paper gives the results obtained by taking cultures of 2,892 home contacts with 619 cases of epidemic meningitis over a period of 6 months.

The percentage of carriers to contacts varied weekly, from 0 to 65.6 per cent. The highest percentages were found during the winter and early spring months, and the lowest during June and July.

More than one nasopharyngeal culture is needed to detect a considerable number of carriers.

Sex and age play no part in the tendency to become a carrier.

The number of persons in a house has no relation to the percentage of carriers found.

Carriers persist for 2 weeks as frequently in warm as in cold weather, although the actual number of carriers is greatly diminished.

As a result of measures instituted for the control of home contacts with cases of epidemic meningitis, 70 per cent of meningococcic carriers have been isolated until the carrier condition has terminated.

* Negative for meningococci. Other organisms are always present.

NOTE: Assistance has been given in the laboratory work by Catherine O. Wiltsie, Norma H. Broom and Irene Baisley.

REFERENCE

1. Frost. *Pub. Health Rep., Reprint 69*, 1918.

Sudden Heart Failure as a Public Health Menace

ALBERT S. HYMAN, M. D., F. A. C. P.

Witkin Foundation for the Study and Prevention of Heart Disease, Beth David Hospital, New York, N. Y.

THE public health aspect of heart disease has been presented with considerable statistical data by many writers during the past decade. Increasing annual morbidity and mortality rates from diseases of the cardiovascular system have been especially demonstrated from such able workers as Cohn,[1] Emerson,[2] Halsey,[3] and Pedley.[4] There can be no doubt that the lay public, as well as the physician, is becoming more and more conscious of the fearful toll exacted by the rheumatic and degenerative diseases of the circulatory system; widespread publicity and organized propaganda for enlightenment have made these facts known to all.

Little, if any, emphasis, however, has been placed upon that phase of the cardiovascular diseases which renders an individual suffering from such a condition a possible menace to the health and happiness of others.

The public health problems concerned with leprosy, smallpox, and typhoid carriers have indicated the health hazards to the community presented by those so afflicted; no less important are the problems concerned with sudden heart failure. Temporary or fleeting attacks of muscular weakness, loss of coördination, or actual unconsciousness, may prove to be a menace not only to the individual himself, but also to all those in his immediate environment. This is especially true when such an individual—in control of powerful mechanical and other appliances which require the entire attention and ability of the operator, drivers of vehicles like automobiles and railroad trains, street car motormen, elevator operators and others in occupations where the lives of many are dependent upon perfect mental and physical functioning—may, as a result of temporary and sudden loss of ability to control their activities, place the lives of others in jeopardy.

Three such cases occurring within the period of a single week recently have served to focus attention upon possible measures to pre-

vent the recurrence of similar tragedies. These cases are presented in some detail in order to demonstrate how varied may be the cardiovascular pathology responsible for the condition.

CASE 1

The first case is that of a man, 54 years old, the driver of an 8-ton automobile truck for 9 years. He was apparently in splendid physical condition, a great strapping fellow, weighing about 230 pounds and 6 feet tall. It was not difficult for him to throw a 150-pound barrel on the truck without assistance.

One day while driving through one of the crowded east side streets, he apparently lost control of the machine, which plunged onto a sidewalk, tearing down a store front. Fortunately only a few bystanders were injured by flying glass. A few minutes after the accident, the driver clambered down from the truck and could offer no explanation of what had happened. He had no difficulty in driving away, and continued with his work the rest of the day.

A few weeks later, and again a month later, similar accidents happened. In the first, the truck tore down a support in a garage, several workmen barely escaping with their lives when the roof crashed. In the other, the truck crashed into several vehicles on the street and many persons were more or less severely injured. In this latter accident, the driver was picked up unconscious and removed to a nearby physician's office.

The doctor noted there were insufficient evidences of trauma to account for the unconsciousness; no signs of fractured skull were found. The pulse was scarcely palpable while the heart sounds were very rapid and weak; the doctor concluded that these findings were associated with shock. In about an hour the patient suddenly resumed consciousness, stood up and insisted on going home. The doctor now noted that his pulse was slow but that the heart sounds were of poor quality, and kindly referred the case to me for cardiovascular study.

The following important findings were made: X-ray examination showed that the heart and aorta were both considerably enlarged; the blood pressure was high, two readings giving systolic 220 and 210 mm. and diastolic 120 and 100 mm. Electrocardiographic examination showed evidences of coronary artery sclerosis with a beginning right bundle branch block. Vital capacity and other tests showed a considerable loss of myocardial reserve. Two days later, while waiting in an examining room the patient complained of feeling weak, and collapsed. Examination at that time revealed a rapid and thready pulse averaging from 130 to 160 per minute. Blood pressure was found to be, systolic 80, diastolic 60 mm. Electrocardiographic studies showed a tachycardia of ill defined origin. The graphic records show the condition so clearly that they are presented to demonstrate his normal rhythm and that occurring during an attack (Figure I). The patient made a quick recovery a few minutes after these tracings were taken and again his blood pressure and pulse rate returned to normal condition. A diagnosis of paroxysmal tachycardia of coronary artery disease origin was made.

The position of a cardiologist in cases such as this is, indeed, perplexing. Inasmuch as the patient has a vascular degenerative disease of the heart which is progressive, and since the attacks are due to sudden circulatory changes, the question of permitting him to resume

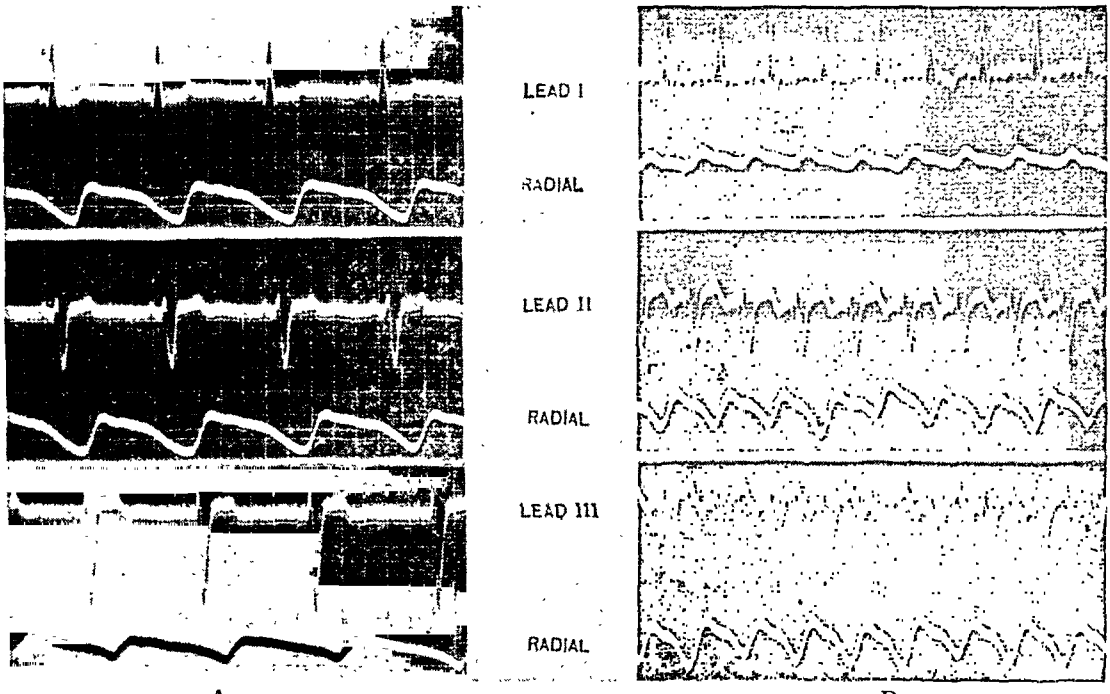


FIGURE I—The upper record in this and in the following figures is the electrocardiographic tracing; the lower is the polygraphic tracing of the radial pulse. Both are photographed simultaneously in order to demonstrate the relation between the electrodynamic phase of the cardiac cycle and the actual mechanical contraction of the left ventricle. The heavy white perpendicular lines represent 0.20 seconds. "A" was taken during the patient's normal rhythm; the ventricular rate is about 60 beats per minute. "B" was taken during an attack; note that the ventricular rate is now varying from 140 to 150 beats per minute. Both records show evidence of coronary artery disease with a marked left axial deviation of the heart.

his occupation as a truck driver is one involving a fine sense of professional judgment and duty. From a public health standpoint in its widest definition there is no question that the patient is a menace to the community as a driver of a great truck upon crowded city streets; the hazard to lives and property should he have another attack while crossing a busy thoroughfare is evident. On the other hand, truck driving is this man's sole occupation and his only mode of livelihood. If the attacks do not recur, he is a capable and efficient member of industrial society; he fills a useful place in the community. It is obvious that if the employer should learn the true nature of the matter he would be unwilling to have the man continue in this capacity, for the liability might be too great.

The rôle of the physician under these conditions is not well defined. Vascular degenerative diseases of the heart are not reportable to the health departments of the city or state, as typhoid carriers and cases of leprosy are; yet as hazards to the public health they are no less important. At the same time, the personal responsibility to the patient and his family demands that he be induced *voluntarily* to give up his

employment as a truck driver, not only for his own welfare but for that of others. In the face of refusal to do this the physician is presented with a double-edged problem: duty and faith to the employer and to his patient. I do not pretend to offer a solution. The patient (case No. 1) after a long discussion agreed to take up some other type of work.

The second case is presented because it is not uncommon and because the public health aspects of the problem are rarely considered, yet the possibilities for harm are great.

CASE 2

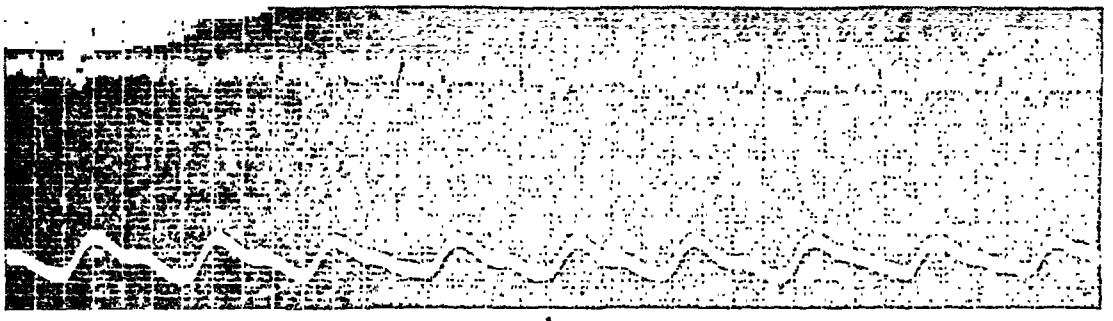
A young woman, aged 28, had been employed as an elevator operator for more than 4 years in a large office building in New York City. Her record had been excellent, but one day, while descending, the car suddenly dropped several floors and many passengers were shaken up. Investigation showed no mechanical defects of the elevator. Subsequently, other accidents occurred to the various cars which this young woman was operating. Inspectors, who were watching her, reported that she was extremely careful but was apparently becoming very "nervous" because of the accidents.

One morning she was found unconscious in a car which was located between the 14th and 15th floors. With some difficulty, officials managed to remove her from the car to an adjacent office and a physician was summoned. He noted that she was pulseless; the heart sounds were very loud but very irregular; the rate was very rapid.

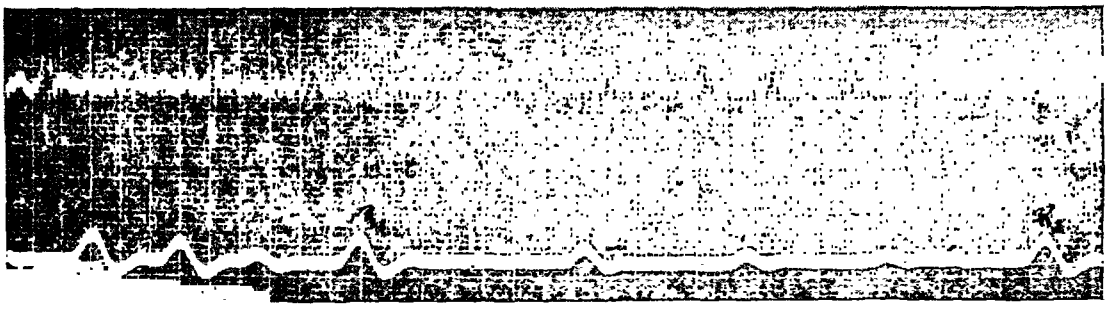
Called to see the case in consultation, I made a diagnosis of paroxysmal auricular fibrillation of mitral stenotic origin. Subsequently it was learned that the patient had a long history of rheumatic heart disease and had suffered from mitral stenosis for many years. Cardiovascular examination revealed a rather typical mitral rheumatic heart with low function tests. The graphic records are especially interesting in showing the difference in the circulation during an attack of fibrillation and during normal sinus rhythm (Figure II).

It can be readily noted that the ventricular rate during the attack of fibrillation is so rapid that the left ventricle is incompletely filled, and sometimes there is a contraction when it is entirely empty; this results in only partial or no opening of the aortic valves. From a hemodynamic point of view there develops a very poor peripheral circulation which clinically is manifest, with attacks of syncope or unconsciousness. Under such conditions the brain usually suffers most, and moments of *petit mal* are common; during this period coördination is lost but may be regained a second or two later. Several such attacks were carefully studied; one is recorded in Figure IIB. Note the radial pulse absent for 4.4 seconds.

The cardiologist's standpoint in this case is clear-cut; the results of the cardiovascular study indicate that the patient is suffering from a severe form of heart disease which may render her at any time unfit for the occupation in which she is engaged. The danger to passengers in the elevator, should she suddenly become unconscious, is too obvious to permit of discussion. A periodic health examination, or an ex-



A



B

FIGURE II—"A" shows a normal auriculo-ventricular rhythm with a radial rate of about 72 beats per minute.

"B" shows what happens when fibrillation of the auricles occurs; the ventricular rate now is grossly irregular, varying from 110 to 150 beats per minute. During the rapid phase the aortic valves do not open and from R_1 to R_2 there is a period of over 4 seconds before an effective beat comes through. The peripheral circulation and especially that of the brain may respond with the usual symptoms of acute anemia.

amination at the time she applied for work, should, of course, have been made. Most of the hazards formerly encountered in elevators have been gradually eliminated with the installation of automatic safety devices; the one great hazard still unprovided for is the *individual* operating the car! Too often, jeopardy to life and limb is caused by physically incompetent persons. In this regard it is interesting, though somewhat distressing, to note that only recently in compiling a list of suitable occupations for the "cardiac cripple," a certain welfare organization recommends "the running of passenger elevators as a job not involving too great stress for those thus handicapped. . . ."

How often the lives and welfare of innocent bystanders may be jeopardized is aptly illustrated by case 3, which was referred to me for cardiovascular study.

CASE 3

A man 61 years old, a stationary engineer, was employed by a structural steel corporation to run a powerful hoist used to raise steel beams and girders to the upper floors of a skyscraper in the process of construction. The control of the mechanism required long experience and instantaneous ability to activate the proper levers in response to signal bells, rung by a "guider" or look-out man high up in the structure of the building.

One day, after a series of minor accidents, which were the result, apparently, of some slip in the coöperation between the guider and the engineer, a steel arch, weighing many tons, through some mistake in signals had slipped and crashed through the sidewalk from a considerable height. When the ambulances had completed emergency work, attention was directed for the first time to the engineer. He was found semi-conscious bending over the gears of his machine; a clammy sweat and a peculiar pallor caused the ambulance surgeon to insist that he go to the hospital. After a brief stay, he returned to his home; the following day he had another attack which rendered him partially unconscious. The family physician noted that the patient's pulse was very slow, at times 20 to 30 beats per minute, with poor heart sounds.

A few days later after another attack, I made a presumptive diagnosis of complete heart block or auriculo-ventricular dissociation. Cardiovascular studies revealed a rather unusual phenomenon which is very beautifully visualized by the accompanying electrocardiographic and polygraphic tracings (Figure III). The

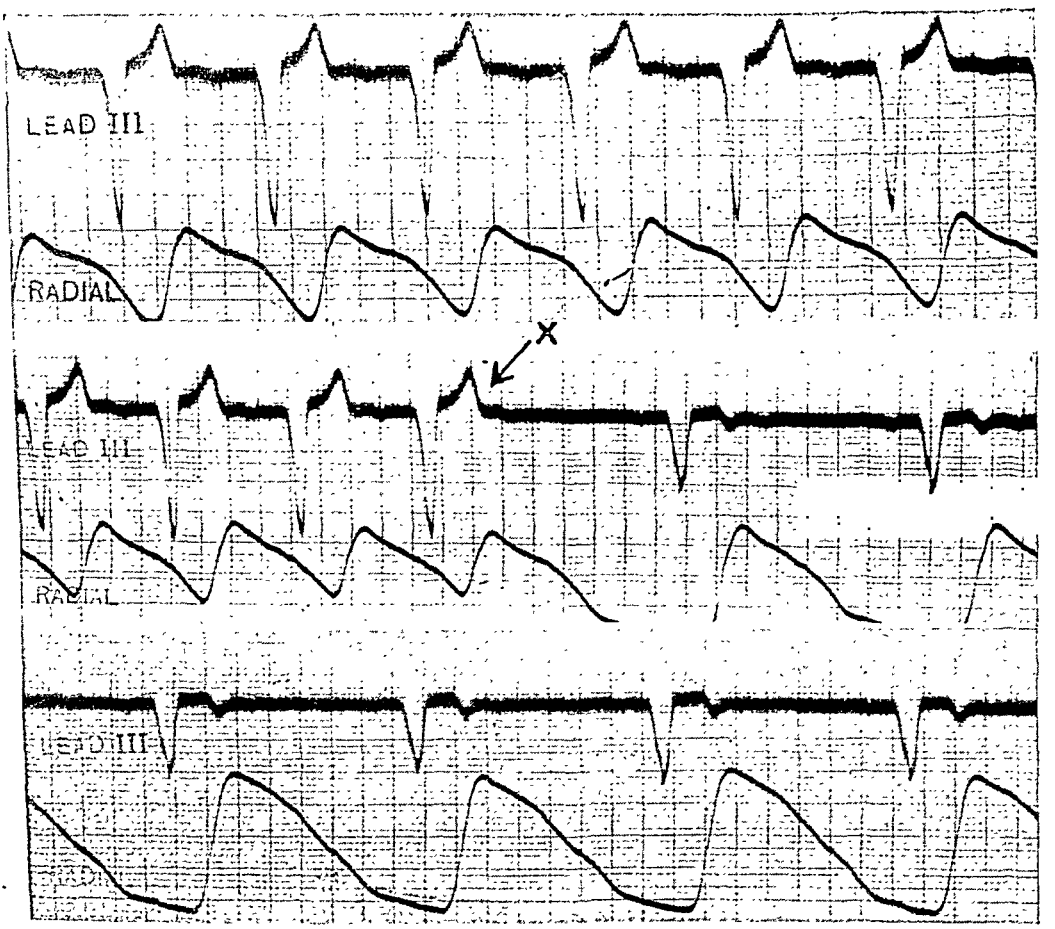


FIGURE III—The three records are continuous from above downward. The first shows a normal sinus rhythm; there is present in other leads evidence of serious myocardial damage. The radial rate averages 74 beats per minute. The second record shows the sudden transition from sinus rhythm to complete dissociation of auricular and ventricular rhythms; the radial rate drops to 34 beats per minute.

patient had an attack during the examination. It will be noted that the normal sinus rhythm at the point marked "X" suddenly stops and there develops a slow, less regular rate of about 38 beats per minute, with independent auricular and ventricular rhythms. The condition from a cardiologic point of view approaches the Stokes-Adams syndrome, but in this case the symptomatic response to the sudden change of rhythm is out of proportion to the actual change in the peripheral circulation.

The sudden change in the rhythm is responsible for the period of unconsciousness or loss of coördination ability. Under ordinary conditions of life such attacks of weakness may not be of great significance, but in a position involving tremendous physical and mental responsibilities they may assume tremendous importance.

In presenting these three cases, the public health aspect has been emphasized, as attention is usually focused upon the individual himself. Treatment and prognosis have no place here, but the problem of preventing such accidents may well invite our consideration.

Accident prevention in so far as it is dependent upon the integrity of the human mechanism must receive its greatest support from the facts and information discovered by personal examination of the individual; this is especially true where an individual is engaged in an occupation where great hazard to others may be the result. In this group may be placed the condition known, for want of a better name, as "sudden heart failure." But the name "sudden heart failure" is in itself paradoxical; the condition nearly always occurs in persons *who have had heart disease for some time.* It is *sudden* only because there is an acute change or re-arrangement of the circulation. If this be true, then the attack might be anticipated, and had public health measures kept pace with the knowledge of cardiovascular diseases, such accidents might be entirely avoidable!

The solution of the problem, as I see it, is not difficult; it means periodic health examination propaganda carried to legislative bodies. Individuals employed or seeking employment in the occupations discussed above would be required to submit to an examination to prove their physical ability to cope with the demands of their work without danger to themselves or others. Sufferers from heart disease should not be required to undergo the stress and effort attendant upon occupations which might prove to be hazardous. They and the community as well should have the same protection as that afforded where there is disturbance of vision. The State of New York, for example, demands that all applicants for automobile drivers' licenses shall be able to see certain standards without glasses. What avails it, therefore, to prevent the blind from driving when a man with serious heart disease may fall dead at the wheel of a large automobile truck? The danger to the bystander appears to be equally great in either case.

Great public health benefit will accrue from the enforcement of examinations of those employed in the hazardous and semi-hazardous occupations. Heart disease, when it is diagnosed, must be considered one of the great causes of preventable accidents, and to those interested in the problem an opportunity for splendid and far reaching public health service is offered.

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New Legislation to Protect Mothers in Italy

AN Italian decree law of May 13, 1929, prohibits the employment of women during the last 4 weeks of pregnancy and the first 4 weeks after childbirth. The woman's position must be reserved for her during this time and also during an additional period not to exceed 3 months if she is unable to return to work at the end of the shorter period. A confinement benefit of 150 lire (a little less than $8 at the current rate of exchange) is to be paid to the women and also a weekly sum equal to the unemployment benefit is to be paid to those who are subject to unemployment insurance, as the majority of manual and clerical workers are. Two special rest periods of 1 hour each must be given daily to nursing mothers until their children are 1 year old.

The law includes manual and clerical workers in all industrial and commercial establishments, and may be extended by royal decree to women employed in heavy agricultural work. Fines are provided for violations of the law (*Gazzetta Ufficiale*, Rome, June 6, 1929, p. 2538).

This decree is intended to supplement previously enacted measures for the protection of employed mothers. For instance, the labor law of 1907 prohibited the employment of women in industry for 4 weeks after childbirth; the present decree adds to this period 4 weeks before childbirth, and extends the provision to all manual and clerical workers.

The maternity insurance law, as amended in 1923, provided a maternity benefit of 100 lire; this amount is raised to 150 lire by the new decree, and is to be paid not only to industrial workers but also to workers in commercial establishments. Finally, there is provided for the first time a weekly cash benefit to be paid to women absent from work on account of childbirth.

Endemic Goiter and Its Relation to Iodine Content of Food *

JAMES A. HAYNE, M. D., FELLOW A. P. H. A.

State Health Officer, Columbia, S. C.

GOITER has been described since ancient times; its treatment by food supplies containing iodine was practiced in China thousands of years ago; and it is said that burnt sponges which contained iodine were used by the Phoenicians for the same purpose.

I think it is well to establish in our minds just what we mean by goiter. In looking over the surveys which have been made in various countries, we find that a simple palpable enlargement of the thyroid gland exists in perfect health, especially in females where the enlargement of the gland is not uncommon at the catamenial periods and also during pregnancy. When the thyroid gland enlarges to the extent that it is visible, conspicuous, unsightly and may produce pressure upon the windpipe and other important structures of the neck, it may be termed goiter.

Goiter is one of the best examples we have of an endemic disease. It occurs all over the world but is much more prevalent in certain localities, such as large valleys, mountainous regions, and elevated plains, where also the condition known as cretinism is found. Many theories have been advanced as to its cause, but the accepted idea at present is that it is due to a deficiency of iodine in the food or water supply of the particular locality in which goiter is endemic. We are speaking entirely of simple, not exophthalmic goiter, Graves' disease, or Von Basedow's disease. Here we have a pathological condition with extremely dangerous symptoms.

Baumann, in 1895, discovered that the human thyroid contained an organic compound of iodine. Kendall, in 1914, isolated from the thyroid gland of a sheep a substance which he called thyroxin, which contained 65 per cent of iodine. This was synthetically produced in the laboratory by Harrington. The function of the thyroid gland is to produce this thyroxin. When it fails to produce it in sufficient

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quantities we have the condition known as hypothyroidism; the cells of the gland then proliferate and we have enlargement of the thyroid gland, or goiter.

We have a goiter map prepared by Dr. Olesen of the U. S. Public Health Service which shows the distribution of goiter in the United States, from the results of the examination of drafted men in the recent war. As it relates only to men it is very inaccurate. Proper surveys to determine the amount of goiter in the various states of the United States have been made in but few states. Surveys made in Minnesota, Montana, Michigan, and recently South Carolina, and some surveys made in Tennessee, some in Ohio, and possibly in some other states, furnish all the data we have. In looking over the literature of the U. S. Public Health Service in regard to the occurrence of goiter in the United States we find that most of the statements are based upon guesses made by state health officers for their respective states. I wish to urge that a complete survey be made so that we may know how much goiter we have and where it exists. Roughly speaking, the goiter area consists of an area of the United States containing about 30 million people. In this area are the states of Illinois, Wisconsin, Ohio, Iowa, Indiana, Nebraska, Michigan, the two Dakotas and Montana; and on the west coast, Oregon, Washington and California. Surveys of high school girls in Michigan and Minnesota show that as high as 70 per cent show definite thyroid enlargement.

Studies of the water supplies of these areas show a great deficiency in the amount of iodine present, and certain methods have been adopted to furnish it, such as the use of table salt containing iodine. This salt has been widely put upon the market, and there is great difference of opinion as to the results obtained. It was suggested by Dr. Turrentine, of the U. S. Department of Agriculture, that possibly food would contain iodine in natural combination which would be less rapidly eliminated from the body than the inorganic iodine, and would produce better results in the prevention and treatment of goiter. This was reasoned out from the analogy in the treatment of pernicious anemia.

It was found that when people who suffered from pernicious anemia were treated with liver, the iron and copper contained in the liver relieved the condition, whereas iron and copper administered as inorganic salts did not have any such effect. Beard and Myers, at Western Reserve University, treated rats with liver and found that they could relieve the pernicious anemia, whereas they could not relieve it by administering copper, manganese and iron in inorganic salts.

TABLE I

GOITER SURVEY OF SOUTH CAROLINA

County	*No. Examined*	*Normal*	*Enlarged*	*Percentage Goitrous* *
Beaufort	230	224	6	3
Berkeley	315	312	3	1
Charleston	3,168	3,039	129	5
Dorchester	834	828	6	1
Georgetown	408	406	2	1
Horry	729	720	9	1
Total	5,684	5,529	155	3
Darlington	819	807	12	1
Dillon	1,622	1,499	123	8
Marion	392	384	8	2
Orangeburg	1,301	1,269	32	3
Total	4,134	3,949	185	5
Aiken	1,566	1,555	11	1
Fairfield	515	502	13	3
Richland	278	272	6	1
Total	2,359	2,329	30	2
Anderson	573	564	9	2
Cherokee	564	543	21	4
Greenwood	684	667	17	3
Newberry	700	685	15	2
Greenville	1,433	1,425	8	1
Oconee	1,008	994	14	2
Spartanburg	461	455	6	1
Total	2,902	2,874	28	1
Grand Total	17,600	17,140	460	3.8

* Percentages given to nearest whole number.

It was found by Robsheit, Robbins and others that the liver contained 58.5 p.p.m. of iron, 75.9 of arsenic, 145 of copper, 49 of manganese, and 30.3 of calcium; that the kidney contained 108.9 p.p.m. of iron, 142 of arsenic, 101 of copper, 106 of calcium and 154 of manganese. It was also found that dried apricots contain 48.4 p.p.m. of iron, 181.3 of arsenic, 144.5 of copper, 140 of calcium, and 140.1 of manganese. Accidentally in feeding rats with dried apricots they were obtaining practically the same results as from the use of liver.

Reasoning from the above it was thought that perhaps the iodine contained in vegetables would be of great benefit in the treatment of goiter, and the experiments of Beard and Myers with rats seem to confirm this theory.

Upon the basis of the foregoing it was decided to have an analysis made of the vegetables and fruits of South Carolina. A number of

tables are presented showing the large content of iodine in the fruits and vegetables of South Carolina.

Results of a recent survey of South Carolina for goiter are given in Table I.

The amount of iodine in the daily ration necessary in order to maintain iodine balance is unknown. We know of but one careful experiment—that of Dr. von Fellenberg of Switzerland, who was able to maintain iodine equilibrium over a period of 4 weeks in a man on a diet which contained 0.0143 mg. per day (equivalent to 5.22 mg. per year). It is interesting to calculate the weight in ounces of some fresh vegetables from South Carolina which will yield this amount of iodine (see Table II).

TABLE II

IODINE IN SOUTH CAROLINA VEGETABLES

	Leafy Vegetables	
Cabbage	Average of 8 samples	7 ounces
Lettuce	" " 9 "	8 "
Spinach	" " 14 "	7 "
Turnip Tops	" " 5 "	10 "
	Potatoes	
Potatoes	Average of 76 samples	11 ounces
Sweet Potatoes	" " 70 "	16 "
	Roots	
Beets	Average of 4 samples	24 ounces
Carrots	" " 8 "	21 "
Turnips	" " 12 "	23 "
Asparagus	" " 22 "	27 "

On this basis a diet containing 4 oz. of green vegetable, 8 oz. of potatoes and 4 oz. of root vegetable would yield 0.021 mg. of iodine per day, which is about 150 per cent of the value of von Fellenberg. Since this quantity can be, and frequently is, eaten at a single meal, it is felt that these vegetables are adequate for goiter prevention when eaten regularly.

The survey in South Carolina shows that we have a small amount of goiter, and one naturally asks why, if we have so much iodine in food, we have goiter at all. This is easily answered when we consider that the people do not eat South Carolina vegetables. A study of the situation seems to show that vegetables used in the cities of South Carolina come largely from other states. This is especially true of canned vegetables, as there are no large canneries in the state. It is also true that a great many people do not eat vegetables. In a study of pellagra it was found that although foods containing sufficient pellagra preventive were on the tables of many people in South Carolina, they were not eaten by all the family.

TABLE III

IODINE CONTENT OF SOME SOUTH CAROLINA VEGETABLES, COMPARED WITH RESULTS PUBLISHED BY MCCLENDON FOR VEGETABLES PRODUCED IN CALIFORNIA AND OREGON

	South Carolina Analyses by Remington	California Analyses by McClendon	Oregon Analyses by McClendon
	p.p.b.	p.p.b.	p.p.b.
String beans	429	—	29.0
Beets	233	8 0	—
Carrots	135	8.5	2.3
Lettuce	754	—	—
Peas	197 (ripe)	8.4 (green)	—
Potatoes	517	—	—
Spinach	424	26.0	19.5
Soup vegetables	—	—	13.5
Squash (summer)	1,018	—	—
Sweet potatoes	135	—	—
Tomatoes	273	17.5	—
Asparagus	145	12.0	—
Cabbage	504	—	—
Cucumbers	523	—	—
Egg plant	338	—	—

Results are in parts per billion of iodine in the dried vegetables.

We are just beginning to appreciate the part that food plays in the prevention of disease and the conservation of health. When the germ theory was evolved it was thought that the question of disease prevention was settled, but as the years have elapsed we have found that there are many things that have to be added in order to explain correctly the transmission of communicable diseases, and also that there are many diseases which are not caused by germs but by faulty food habits.

The laboratory which we have established in Charleston in connection with the South Carolina Medical College is making analyses of all vegetables and fruits grown in South Carolina, and these are being compared with analyses made in other states. Unfortunately, this work has been carried on only in a very few states and we have very few data for comparison. It is urged that each state health officer inform himself as to the methods used both by Dr. McClendon of the University of Minnesota, and Dr. Roe E. Remington, our chemist in Charleston, and that proper analyses be made of the fruits and vegetables of other states so that we may have a basis of comparison.

One outstanding discovery has been made through our analyses which upsets completely a theory which has been held in regard to where iodine would be found in the largest quantities. It has been held for a long time that the salt spray, or the sea spray, was the source of iodine. Tables V and VIII seem to disprove this theory, as we find the iodine content of our fruits and vegetables higher in the

TABLE IV

IODINE CONTENT OF POTATOES FROM DIFFERENT REGIONS

Sample No.	Source	Locality	Iodine in parts per billion dry basis
212	Idaho	Twin Falls	160
294	"	Moscow	125
306	"	Hansen	45
			Average 110
129	Maine	Monmouth	203
133	"	Brunswick	283
137	"	Orono	188
138	"	Presque Isle	105
			Average 195
195	Michigan	Pontiac	120
161	"	Greenville	110
168	"	Manton	69
297	"	Chatham	75
			Average 94
139	Minnesota	Grand Rapids	67
140	"	"	117
141	"	"	75
143	"	"	26
144	"	"	70
145	"	"	109
146	"	"	125
147	"	"	98
			Average 86
148	North Dakota	Fargo	78
	South Carolina 72 samples		87 to 544
			Average 211

mountainous regions of the state, 250 miles from the coast, than in areas 30 or 40 miles from the coast. Of course, right along the coast there is more iodine in the vegetables. Granite and other rocks which are found in the Appalachian Mountains contain iodine, and

TABLE V

IODINE CONTENT OF POTATOES IN RELATION TO DISTANCE FROM THE SEA

Distance from Sea	Number of Samples	Iodine Content in parts per billion dry basis (Average)
0– 50 miles	19	180
50–100 "	16	213
100–150 "	15	223
150–200 "	15	249
200– "	4	266

TABLE VI

	Per Cent Goitrous
Michigan (75)	
Houghton County	71
Wexford County	56
Midland County	33
Malcolm County	26
Grand Rapids—Kent County	40
Minnesota (76)	
St. Paul	73
Average of thirteen towns	71
Montana (77)	
Fergus County	49
Carbon	39
Cascade	34
Big Horn	25
Hill	13
Ohio-Cincinnati	40
Colorado (78)	40
Utah (79)	54
Kansas (80)—Topeka	50
Connecticut Average	29
Manitoba (81)	43–79

TABLE VII

IODINE IN SOUTH CAROLINA WELLS, SPRINGS, STREAMS, AND CITY WATER

Date 1928	Type of Water	Location	Iodine p.p.b.
2–13	Seneca River	Clemson College	1.86
4–17	Enoree River	Greenville County	5.54
4–17	Saluda River	" "	2.08
5–8	Broad River	Union County	6.53
5–15	Edisto River	Orangeburg	3.15
5–26	Big Pee Dee River	Near Florence	2.53
5–26	Black Creek	" "	2.52
4–17	Georgia's Creek	Near Easley	2.81
4–17	Table Rock	Pickens County	1.94
2–23	Spring	Clemson College	0.39
4–17	Spring—Chick	Greenville County	2.05
5–15	Well (R. N. Brackett)	Clemson College	4.22
5–15	Well (Hotel)	" "	1.25
1–19	Rain Water	" "	1.93
2–22	Drinking Water, raw	" "	2.41
2–23	" pure	" "	1.75
5–15	" raw	" "	2.20
5–15	" pure	" "	1.10
5–22	" raw	Spartanburg City	5.12
5–22	" pure	" "	1.41
5–28	" raw	Columbia City	4.16
5–28	" pure	" "	2.21
6–8	" raw	Charleston City	4.51
6–8	" pure	" "	2.10
6–12	" raw	Greenville City	5.42
6–12	" pure	" "	3.16

TABLE VIII

IODINE CONTENT OF POTATOES IN RELATION TO SOIL AREAS

Soil Area	Number of Samples	Iodine Content in parts per billion dry basis (Average)
Coastal Region	7	198
Lower Pine Belt	16	164
Upper Pine Belt	12	234
Sand Hills	7	191
Piedmont	27	249

the disintegration of these rocks has increased the amount of iodine found in the soils in the upper part of the state.

Iodine is a natural plant food and where it is contained in large quantities in the soil plants grow extremely well. It seems that in the metabolism of the plant iodine is the natural constituent, as it is in the metabolism of man. Iodine is contained in fish, oysters, and other sea life, but these are not staple articles of diet in the state; in fact, they are not used as such even on the coast. McClendon and others have examined a large number of samples of surface water from different parts of the United States, but there is practically no place in the country where drinking water contains enough iodine to provide for the needs of the body. The examination of foods in Maine and Connecticut revealed that there is more iodine in these than in corresponding products in Wisconsin, Minnesota and Oregon, and there is more goiter in Wisconsin, Minnesota and Oregon.

We felt that the work done under the auspices of the South Carolina Food Research Commission—composed of Dr. William Weston, Chairman, the President of the State University, the President of the State Medical College, the President of the State Agricultural College (Clemson), the State Health Officer, and Dr. R. R. Walker—was of such importance and brought out so many new facts in regard to the iodine content of foods, that it should be called to the attention of the Conference of State and Provincial Health Authorities of North America, with a view that they might make an investigation and study of these facts, and provide that such food analyses be made in their own states. We know that South Carolina fruits and vegetables contain sufficient iodine for nutritional purposes, and if people will eat South Carolina fruits and vegetables they may reasonably expect not to have goiter.

Industrial Cleanliness and the Courts

JAMES A. TOBEY, LL. B., DR. P. H., FELLOW A. P. H. A.

The Borden Company, New York, N. Y.

LAWS requiring adequate washing facilities to be provided for the employees in various industries are now in force in one-half of the United States. Most of this legislation refers only to special conditions, such as those in coal mines, lead works, or foundries, but some of it applies to all factories and mercantile establishments. Where a law is limited in its application, there may be raised against it constitutional questions which can be decided only by the courts in actions brought before them.

The constitutionality of state washroom laws has been adjudicated by courts of last resort on 8 occasions, including decisions by the Supreme Court of the United States and the highest tribunals of 5 states. In only 1 state is such a law now held unconstitutional, and in that case only because the method of securing establishment of a washroom in a plant is held to be at variance with a special provision of the state constitution. In all other instances the legal principle seems well established to the effect that it is a valid exercise of the police power for the state to require owners or operators of certain industries, such as coal mines, to provide washrooms for their employees, and, furthermore, that the statute may require that such washing facilities be furnished on the demand of a specified number of the employees.

The first litigation on this subject arose in Illinois as a consequence of an act of 1903 (Hurd's Rev. St. 1903, c. 93, No. 37) which required owners of a coal mine to provide and maintain a washroom at a convenient place at the top of the mine. A mine owner was convicted in a lower court for violation of the act and appealed to the Supreme Court of Illinois, which handed down its opinion in 1906.[1] It was insisted on behalf of the defendant that the statute was unconstitutional and the court decided in this case that the law placed upon mine owners a burden not borne by other employers of labor and discriminated in favor of mining employees against laborers engaged in other occupations. For these reasons the act was held invalid as special legislation and as an improper exercise of the police power. Later decisions have, however, changed this principle.

A law of broader scope was passed by the Illinois Legislature in

1913 (Hurd's Stat. 1913, c. 48, No. 184). This act required the maintenance of a sanitary washroom at a convenient place by every owner and operator of a coal mine, steel mill, foundry, machine shop, or other business in which employees become covered with grease, smoke, dust, grime, and perspiration to such an extent that to remain in such a condition after leaving work without washing and cleansing their bodies and changing their clothing would endanger their health or make their condition offensive to the public.

In the litigation which immediately arose—incidentally from the same county as before—the Supreme Court held that this law was valid,[2] stating:

> The purpose of the law is to promote the health and welfare of employees in certain lines of business where conditions are such that every facility should be afforded for cleanliness, and to provide for the comfort and welfare of those with whom such employees come in contact after leaving their place of employment.

This law was held good under the police power of the state, especially since the legislature in enacting the later statute undoubtedly had in mind the previous court decision.

This same law was, however, construed in an extraordinary manner by the same court in a decision delivered a few years later.[3] A railway company was convicted of failure to comply with this statute and the court held that a roundhouse where 60 men were employed did not come within the purview of the law. This, of course, was a question of fact and it was ruled that "the evidence did not bring the roundhouse and the machine shop within the terms of the statute." The sanitary conditions which usually prevail at roundhouses would hardly seem to justify the result.

At about the same time that the Illinois statute of 1913 was sustained, an even more drastic law in Indiana was pronounced valid. This particular act required the owner of a mine to provide washing facilities when 20 or more of the employees petitioned for the installation of such facilities. The Supreme Court of Indiana held that this act was constitutional, saying:

> The provision of the law is a salutary one and is no more unreasonable than the provision of the law which requires the mines be guarded, lighted and ventilated. This act has to do with the comfort, health and care of the employees of mines, and is within the legislative discretion.[4]

The mine owners were not satisfied with this decision, and appealed to the Supreme Court of the United States, on the ground that their rights had been infringed under the Constitution of the United States. The highest court of the land denied this contention and sus-

tained the constitutionality of the state law with respect to its operation under the national constitution, holding that the act did not deny equal protection of the laws.[5] In the course of its opinion, this court stated:

> Having the power in the interest of the public health to regulate the conditions upon which coal mining may be conducted, it cannot be limited by moments of time and differences of situation.

In the same year that this decision of the Supreme Court of the United States was written, the Supreme Court of Kansas upheld a law of 1911 of that state, which required owners of coal mines to furnish washrooms.[6] As in the early case in Illinois, it was asserted that the law was discriminatory, in that it did not place a similar burden on the operators of other mines. The court held, nevertheless, that this contention was not correct as a matter of law. It was the province of the legislature to determine the necessity for the law and the subject came properly within the police power of the state. The Kansas court relied in part on the McLean v. Arkansas and Booth v. State decisions cited above. (See footnotes 5 and 4, respectively.)

The one case which has gone contrary to these decisions is a Kentucky one, decided in 1922.[7] Here there was a state law similar to that in Illinois in that it applied to various industries where employees were covered with grease, smoke, dust, grime and perspiration, and it was also similar to that of Indiana in the provision that a washroom must be erected when 30 per cent of the employees so decide and notify the owner.

In an exhaustive opinion the Court of Appeals of Kentucky reaches the conclusion that the law in question is inconsistent with a section of the Kentucky constitution, which prohibits the enactment of a law to take effect upon the approval of any other authority than the General Assembly. Certain subjects are exempt from this provision, but the regulation of coal mines is not among them, nor is there any provision for such regulation in any other section of the state constitution. Although the Indiana constitution has a somewhat similar provision and the washroom act of that state was upheld under it, the Kentucky court did not feel that it could depart from its consistent attitude in holding that the constitution of its own state was more stringent in this regard.

The most recent case on this subject was decided by the Supreme Court of Tennessee on December 8, 1928.[8] In this decision a statute of 1921 requiring that wash-houses be provided at coal mines employing 50 or more persons was sustained as valid and constitutional. The court held that this legislation was a proper exercise of the police

power and that it was entirely proper for the legislature to decide to legislate in this manner after considering all aspects of the problem. The law, applying only to coal mines of a certain size and over, was held not to be class legislation, because—

> Legislation designed to protect the health of coal miners cannot be said to be founded upon an arbitrary classification, because it is not extended to other industries, in which the legislature may have found that working conditions were dissimilar.

While on this subject of cleanliness, one other court decision should be mentioned. That was a case decided in 1919 by the Supreme Court of Appeals of Virginia, which inferentially sustained an act to prohibit the use of roller towels in public lavatories, but held that a lavatory in an office building owned by a private individual is not a public lavatory and that the act does not apply in such instances.[9]

The great weight of legal authority, as shown by this brief review of the pertinent court decisions on cleanliness in industry, is to the effect that a state is acting properly within the scope of its police power in passing legislation requiring industries generally, or certain special industries where conditions warrant, to install adequate washing facilities for the health and comfort of their employees. Such legislation is not, as a general proposition, invalid because it makes the establishment of washing facilities contingent upon a petition from a certain number of the employees, though this requirement has been held in one instance to be inconsistent with a state constitution.

REFERENCES

1. Starne v. People (1906), 222 Ill. 189, 78 N. E. 61, 113 Am. S. R. 389.
2. People v. Soloman (1914), 265 Ill. 28, 106 N. E. 458.
3. People v. C. C. C. & St. L. R. Co. (1919), 285 Ill. 523, 123 N. E. 579.
4. Booth v. State (1913), 179 Ind. 405, 100 N. E. 563, Ann. Cas. 1915 D. 987, L. R. A. 1915 B. 420.
5. Booth v. Indiana (1915), 237 U. S. 391, 59 L. Ed. 1011, 35 S. Ct. 617. The same principle is upheld in McLean v. Arkansas (1909), 211 U. S. 539, 29 S. Ct. 206, 53 L. Ed. 315, though in this case the law dealt with the measuring of coal.
6. State v. Reaser (1915), 93 Kan. 628, 145 Pac. 838.
7. Commonwealth v. Beaver Dam Coal Co. (1922), 194 Ky. 34, 237 S. W. 1086.
8. Sun Coal Co. v. State (Tenn. 1928), 11 S. W. (2d) 893.
9. Irvine v. Commonwealth (1919), 124 Va. 817, 97 S. E. 769.

Voluntary Agencies' Activities in a City Health Education Program*

BLEECKER MARQUETTE, FELLOW A. P. H. A.

Executive Secretary, Cincinnati Public Health Federation, Cincinnati, O.

THE general guiding principle as to the part voluntary agencies should play in the health education program is, generally speaking, the same as that which should guide their general program of work in relation to the community's health program. Governmental agencies have the right of way in both cases.

We may safely assume that it is the obligation of the city health department to do two things in addition to whatever other activities it may undertake. One is to bend its efforts constantly to keep the public acquainted with the functions, purpose and needs of the department; and the other is to keep the public informed as to the health conditions existing in the community as revealed by vital statistics available through the city health department. How much the official department may do beyond that depends upon the zeal and interest of the director, his understanding of the importance of educational work, and his facility or that of a staff member in the art of telling his story to the community, particularly regarding the question of the funds available.

How much the private health organizations should undertake to do will therefore be dependent upon the program of the official department. Competition, above all, is to be avoided. For the sake of harmony and progress the private organization should withdraw in favor of the official department whenever there is a conflict.

The great development of volunteer health activities in recent years, in the fields of tuberculosis, nursing, child hygiene, dental health, housing, cancer, heart disease, social hygiene, mental health, and work for the blind and the deaf, has resulted in most communities in a decidedly disjointed method of health education. The emphasis given to one or another problem is great or little depending upon the vigor, power, and funds of the organization interested in that particular field. Some fields may be practically ignored. Publicity efforts often over-

* Read before the Public Health Education Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

lap and interfere with each other. One of the first jobs of private health organizations is, therefore, to coördinate their publicity and educational programs. This has been done in but few communities. Nevertheless, it is one of the developments that lie ahead and must be attained before the volunteer agencies will find their proper place in the health education scheme and produce results accordingly.

Dr. Louis I. Dublin tells us, and his judgment is confirmed by others, that life expectancy can be increased another ten years if we can apply all of the public health knowledge already available to us, but that to do the job with the highest degree of efficiency the public health department needs a per capita appropriation of $2.50 annually. No health department in the United States has attained such a goal. It seems reasonable to assume that it will be many years before it can be attained for the majority. Whether we consider Dr. Dublin's goal attainable or not, there will be general agreement that far larger appropriations are needed than are now available. Here alone is a task that may well provide a major objective for health organizations for some years to come. It should be one of their main objectives.

Voluntary agencies must interpret their own work and their own problem to the public. Their effectiveness and their financial support will depend to a considerable degree upon their success in this direction. It has usually been true in the past that new pieces of work have to be launched and carried on for a considerable period by volunteer groups. This is true in some communities more than in others, depending to some extent upon the initiative and ingenuity of the health officer, but more upon the relative difficulty of securing funds for official health departments.

In the field of tuberculosis, while most of the actual services are being, and should be, taken over by official departments, a large portion of the task of educating the public to a knowledge of the cause, prevention and cure of the disease, and the operation of summer camps; stimulating reporting by physicians; working along with city officials for adequate sanatoriums and a high grade of service rendered by them in improving the social service and relief programs for the tuberculous; taking charge of industrial placement and similar activities; will fall to the lot of private organizations. In those communities in which the official department has advanced to the point where it has the funds and the staff to carry most of these functions, every encouragement should be given the official department to do it, leaving to the private organizations, perhaps primarily, the task of supplementing the education program.

Not many health departments are equipped to carry on programs

in cancer control or in the prevention and relief of heart disease. So long as these activities are new and not sufficiently demonstrated to make it easy for the health department to undertake them, or where the department cannot get the needed funds, the work should be initiated and carried on by private organizations. A vital part of the task is, of course, education.

There is considerable question as to whether the job of bedside nursing will for many years be considered a part of the responsibility of the official agency. There is no group in the community with greater opportunity to teach the fundamentals of public health in a quiet, practical and effective way than the visiting nurse, for there is no time when information about health "sinks in" more effectively than during illness in the home. Many visiting nurse associations have realized not fully their great opportunity in this field. It remains one of the developments to be fulfilled in the future.

The growth of medical and health service in industry has not been so rapid as many of us have hoped. The average captain of industry seems to be impressed with the fact that he can best limit himself to the job in hand, and steps over only grudgingly and reluctantly into such a field as health protection for his employees. Health education in industry, with the encouragement of the periodic examination of the workers, remains one of the jobs that we have scarcely started. While industrial hygiene is within the province of the official department that is interested and able to undertake it, yet in all probability it will remain for volunteer organizations to take the lead for some time to come. Education will be an important factor.

The city health department is obligated to direct the attack on venereal disease, though at present privately conducted clinics will have to carry on. Law enforcement measures cannot well be assigned to agencies that have not the authority of law. When it comes to the question of teaching sex hygiene, however, it is the volunteer groups that will have to assume the burden. They need also to supplement the efforts of public officials in teaching the facts about these diseases and securing funds for providing adequate service.

It does not often happen that a public official will build up a vigorous program of housing improvement, although he must enforce such laws as may be enacted. Private citizens can stimulate public interest, formulate modern housing and zoning legislation and help to get it enacted, encourage the construction of good homes, teach tenants, and secure public support for vigorous enforcement of the law. It would be difficult to find a city that is doing a good housing job without the educational power of a private agency.

Public health workers interest themselves but little in the field of mental hygiene. They consider to be outside their province such matters as facilities for the care of the insane, the problem of the feebleminded, and that whole broader field of mental hygiene that has to do with the prevention of the minor mental and nervous disorders which cause such a large degree of unhappiness and inefficiency. For the most part it is a task falling to the lot of private agencies, boards of education, or departments of public welfare. There are few fields in which there are more misconceptions and less real understanding.

If communities are to be provided with the right kind of clinic facilities, fitted to the need, properly integrated, conducted in such a way as to enlist rather than to disparage the interest and sympathy of practicing physicians, it is private groups who are most likely to do it. Not that it is a job that cannot be done by a department of health, but the many other tasks devolving upon such departments naturally relegate problems of this kind to the background and, moreover, many directors of city health departments feel that clinic service falls within the scope of curative medicine and is not a function with which the public department should concern itself. There is a distinct educational job to be done here in interpreting to the public the purposes and needs of clinic service. Just as the visiting nurse has an unparalleled opportunity to get over some of the facts about health when she makes her bedside visit, so too there is a great chance to do such a teaching job in clinics.

Similarly in the field of hospital care, the health officer does not usually consider it his responsibility to see that the facilities meet the community's needs, except for communicable diseases. This he considers, and quite rightly so, falls within the sphere of curative medicine. Nevertheless, hospital care is important, and it is a part of the health program that needs particular attention, study and interpretation to the public. There is a tendency in many sections of the country toward over-expansion of facilities for the care of the acute sick. Private health organizations have a responsibility for analyzing the hospital situation in the community and making the facts known to the public in order that the most urgent need will be given priority.

Physicians, nurses, social workers, and the public should realize that provision for convalescent care has been sadly neglected. The public and the government authorities need to be informed that the primary causes of death are undergoing a decided change and that with the lengthening of life more and more people are afflicted with chronic diseases. Practically every community is woefully lacking in

hospital accommodations for the chronic sick. We need to find a way to provide hospital beds at prices within the means of working people. All this means more education and better understanding of our problem.

This matter of the mounting cost of medical care is a pressing problem that demands the attention of private health organizations. Dr. Olin West of the American Medical Association has called it "the one great outstanding problem before the medical profession today." From all cities we are confronted with facts showing that people in moderate circumstances are being asked to pay for care in time of sickness, prices that are completely beyond their reach. The result is a growing social problem, increasing bitterness on the part of people thus charged, and a serious conflict between the medical practitioners who view with alarm the increase in free clinic service, and public health workers who can see no other way under the present circumstances of providing medical care for those of limited means. The income of the average practicing physician is low, in many cases not sufficient to repay the high cost of his education. There are obviously two sides to the problem, and it is a problem that requires most serious consideration. Private health organizations have an obligation to coöperate with the national committee now engaged in the study of this situation, and, if a practical solution is found, to help to educate the public to the findings and in carrying out the recommendations.

The conflict between physicians and public health and social workers is disturbing. It is certainly in part due to the fact that we have not used the proper methods in interesting physicians in public health work, nor in interpreting our work to them. Public departments and private organizations share the responsibility alike for doing a better job in this respect. There are many ways in which private organizations can do much along this line, and these opportunities must not be neglected.

The extent to which the general public are misinformed on some of the simplest facts about health is a challenge to health agencies, public and private. Obviously, our combined efforts have been far short of success in face of the fact that $200,000,000 worth of patent medicines are sold every year in this country, and that many more millions are spent in fees to fake practitioners who constantly hoodwink the public. It is not the amount of money wasted that concerns us, but the danger to the diseased patients who place their confidence in fakes and then go to the ethical physician when it is too late. No need to worry about duplication or overlapping of effort in

our fight against this colossal ignorance. Let us all attack this job with every force at our disposal. The outstanding objective of health education is a better understanding by the lay public of facts disclosed by scientific medicine, and dissipation of the countless superstitions that now abound.

In a general way, it should be the job of the private health agencies, after having coördinated their own efforts, to study the public health needs of the community as a whole, to endeavor to make an intelligent interpretation of the facts to the public, and to build up a sound program of health work adequate to meet the whole need of the community.

Health education has made distinct progress. People understand the purpose of health departments better; many of the old fallacies and superstitions on health matters have been dissipated; and the laity in general are much better informed upon the rules of health than they were in the past. The job that lies ahead, however, is almost boundless. So long as practically all departments of health are receiving sadly inadequate funds; so long as almost no community in the country has a really complete and satisfactory health program; so long as in one large city there are 59 different types of medical cures and cults; so long as $200,000,000 worth of proprietary medicines are sold annually; so long as we have constantly to fight against anti-vivisectionists and anti-vaccinationists; there is a job big enough to tax all of the resources of both public and private health agencies. The most inexcusable thing that can happen is for these groups in any given community to fail to work out their programs in such a way as to accomplish the best results with the least expenditure and the least friction.

Accidents Kill More than War

MORE people die annually from accidents in Illinois than were killed in action in any battle of the Civil War.

During the World War 36,931 United States soldiers were killed in action. During the last 7 years accidents have resulted in 38,532 deaths in Illinois.

Only heart disease, cancer and nephritis among all the diseases cause greater mortality than do accidents. In some years the mortality from pneumonia is greater than that from accidents but the average is less.

These comparisons suggest the enormity of the accident problem. Since accidents occur because people are out of tune with their environment it appears that there must be more than a modicum of truth in the assertion that man is his own worst enemy.—*Illinois Health Messenger*, 1, 17 (Sept. 1), 1929.

Educational Aspects of Dairy and Milk Inspection*

C. L. ROADHOUSE

Professor of Dairy Industry, University of California, Davis, Calif.

THERE are many instances where dairy and milk inspectors are employed without experience or technical knowledge of dairying. Where such men are employed, the committee believes that dairy inspection is largely of police control type, unsympathetic in its policies, and in too many instances inefficient in its accomplishments. Where a minimum educational requirement is established, it is believed that constant progress will be made in the improvement of the quality of milk in establishing public confidence in inspection.

Dairy inspectors must meet dairy farmers of all degrees of educational training; the health officer and his assistants and other members of the medical profession; the courts and members of the legal profession; the representative citizens of the community who are interested in important community problems, of which an adequate, safe milk supply is one of the most important; the leaders in community enterprises; chambers of commerce; public welfare organizations, such as the Red Cross, women's clubs, and the Parent-Teacher Association; city and village officials; business men, and operators of dairy plants. The dairy inspector should be able to meet the individual or the group. He should understand their point of view, and in his work get results without making enemies. This demands, in addition to technical training, both tact and a pleasing personality.

The committee believes that if progress along the lines described is to continue, the man selected as dairy control official should be graduated from an agricultural college or from an accredited veterinary college. The subjects recommended for the curriculum should include dairy chemistry, bacteriology, physics, dairy sanitation, and economics. The inspector should have some knowledge, either by experience or otherwise, of the principles of the manufacture of butter, cheese, ice cream, and other dairy products, the production and handling of market milk, and the operation of dairy machinery.

* Report of Committee of International Association of Dairy and Milk Inspectors, 1928.

Dairy chemistry should include not only a thorough training in the testing of dairy products, but some fundamental knowledge at least of organic chemistry and biochemistry. Bacteriology should include general instruction in the principles of bacteriology and a specialized course in the bacteriology of dairy products and in pathogenic bacteriology.

In addition to a complete course of instruction as described, the candidate should have had at least two years' experience or contact with some branch of the dairy industry.

The committee realizes that there are instances where men are available for dairy control work who have had unusual training and experience, and who are, therefore, well qualified to carry on effective dairy control work, although they have no degree from an agricultural college. To cover such cases, a city or state civil service board may include under "education" a statement to the effect that equivalent training, including a knowledge of dairying, together with some college training, may be accepted in lieu of a college degree.

Although the age at which a man may do the most effective work in dairy inspection cannot be definitely stated it is believed advisable to restrict the age of an applicant to the period 21 to 45. Men older than the maximum given may be efficient as dairy control officials, but it is believed that their work in later years will be more satisfactory if they decide to follow this line of work earlier in life.

Some civil service commissions have required that candidates for examination be residents of the city or territory in which the work is to be done. The committee believes that this requirement should be waived in the case of dairy inspector, since the work calls for special qualifications. Such a restriction often works detrimentally, in that some municipalities would be forced to select from a list of unqualified applicants. It is recommended, therefore, that the residence requirements be waived in order that all well qualified men may be given an opportunity to compete in the civil service examination and to qualify for the position.

The committee is of the opinion that the title "dairy and milk inspector" is open to criticism. It does not properly indicate the dignity or responsibility of this profession, nor is the title descriptive of the knowledge and training necessary for modern control work in order to stimulate the interest of the better trained and higher type of men.

With a view of a possible selection of a more appropriate title by the association, the committee recommends for consideration the following titles: "Dairy Supervisor," "Dairy Control Officer," "Chief Dairy Control Officer," "Chief of the Division of Milk Control," or

"Chief of the Division of Milk and Dairy Sanitation." The titles of assistants should be the same except for substituting the term "Assistant."

THE PRESENT SITUATION

To understand the need for recommendations in the field of educational requirements for dairy and milk inspectors, it is necessary that we inform ourselves concerning the present situation. Accordingly, the number of inspectors, the provisions for civil service, and educational requirements for the several types of political subdivisions (cities, counties, states, etc.) are given in Table I.

It should be recognized that it is always difficult to compile such a report and at the same time have it absolutely free of discrepancies, primarily because of the vagueness of the replies in some of the questionnaires. Some states reported a uniform state-wide system of market milk inspection, but the balance of the information submitted indi-

TABLE I

GENERAL SUMMARY OF REPLIES TO QUESTIONNAIRE SENT OUT TO STATES AND CITIES

1. Number of states replying	42
Number of states not replying (Georgia, Louisiana, Mississippi, North Carolina, North Dakota, Oregon, Texas)	7
2. Uniform state-wide system of market milk inspection.	
a. Number reporting Yes	5
b. Number reporting No	37
3. Correlating agencies.	
a. State agricultural or dairy departments reported by	27
b. State department of health reported by	12
c. Others (as state college, etc.) reported by	1
d. Gave no answer	2
4. Civil service requirements (reported by states).	
a. Number of states requiring civil service	9
b. Number of states not requiring civil service	25
c. Number of counties requiring civil service	1
d. Number of counties not requiring civil service	22
5. Educational requirements (reported by states).	
a. Number of states which demand special educational qualifications	7
b. Number of states which do not demand special educational qualifications	26
c. Number of counties which demand special educational qualifications	0
d. Number of counties which do not demand special educational qualifications	25
e. Number of cities which demand special educational qualifications	1
f. Number of cities which do not demand special educational qualifications	22
6. Report from city health departments.	
Number of replies	51
a. Civil service required by	26
Civil service not required by	24
Gave no answer	1
b. Special educational requirements specified by	11
No special educational requirements specified by	38
Gave no answer	2

cated so clearly that they did not have a uniform system that these cases were recorded as "No."

There is apparently a conflict in some of the answers to the questions regarding the educational and civil service requirements. In a few instances it was stated that prospective candidates had to pass civil service examination, but gave a negative answer in their replies to the questions regarding the educational requirements demanded. Civil service implies a certain amount of educational training. The committee had in mind primarily a more special training, such as a college degree in agriculture or veterinary medicine, or, in occasional instances, a training based upon a few years of successful experience.

Government Aid to Housing

SEVERAL investigations made in Europe within comparatively recent years have shown the effect of bad housing on the health of the people. For this reason the governments of several countries have taken measures to aid in the building of workers' houses.

Austria, for instance, permits the government social insurance organizations to loan for the building of workingmen's houses as much as 20 per cent of their capital.

In Germany, the public old age and invalidity insurance funds invested in popular housing nearly 200 million gold marks between the end of 1923 and the end of 1927. One hundred million marks was invested in housing by the National Institute for the Insurance of Clerical Employees between January 1, 1927, and June 30, 1928.

In Italy, the government organizations carrying insurance against industrial accidents, invalidity, and old age are permitted by law to make loans for the building of workers' houses up to one-fourth of their annual receipts; in the last few years these receipts have been, on the average, in excess of 5½ billion lire.

In France, the government is lending money to builders of low-priced dwellings. The budget for 1928 provided for that purpose more than 862 million francs.

In Belgium, the budget for 1928 provided an appropriation of 7,300,000 francs for special premiums to builders of working-class houses.—*Le Assicurazioni Sociali,* Rome, vol. 5, 1929, No. 3.

A New Suspending Medium Used for the Intracutaneous Virulence Test of Bacillus Diphtheriae*

R. V. STONE AND CATHERINE WEIGEL

Bureau of Laboratories, Los Angeles County Health Department, Los Angeles, Calif.

WORKERS in public health who are associated with diphtheria control realize that microscopic diagnosis does not offer conclusive information regarding the pathogenicity of organisms.

Formerly many bacteriologists thought it necessary to inoculate guinea pigs subcutaneously with pure strains. Later modifications permitted the use of the subcutaneous method with a mixed field culture. An immunized animal served as control. Death of the unprotected animal with characteristic lesions evidenced the presence of virulent organisms. Although satisfactory, 2 guinea pigs were necessary for each culture and a period of 96 hours was required to complete the test.

An intradermal method was developed by Force and Beattie in 1922.[1] Field cultures suspended in physiological salt solution were injected into the skin of a white guinea pig. The test dose was 0.2 ml. One hundred units of antitoxin were given 5 hours later. Virulent cultures produced necrotic areas at the site of inoculation. Control animals inoculated at the same time received 200 or 300 units of antitoxin 5 hours earlier. This permitted several tests to be made upon one guinea pig. Experience in our laboratory demonstrated this to be a practical public health procedure, but the protective dose of antitoxin *could* inhibit necrosis if not used with considerable caution.

In 1927 Falk, Tonney, White and Jensen published Electrical Determination of Virulence on Diphtheria Cultures.[2] Later in the same year, they, with Mills, published Electrophoresis of Diphtheria Bacilli.[3] Their work was of considerable interest since it would make possible virulence determination of the majority of routine cultures, without requiring test animals.

The method consisted of determining variations of mobility due to

* Read before the Health Officers' Section, League of California Municipalities, San Bernardino, Calif., October 11, 1928.

the speed of attraction toward the anode of pure cultures suspended in an electrical field.

Experiments were conducted in this laboratory with the view of applying the results routinely. Eighty-seven pure cultures from cases were tested by both electrophoresis and animal inoculations; 56 were virulent and 31 non-virulent by the intradermal test. In the electrical test, 522 mobilities (which represented the average of 6 reversals of polarity for each pure culture) were measured, grouped according to the number of seconds required for the organisms to move the distance of 1 ocular mm.

TABLE I

By Intradermal Test		Electrophoresis seconds required to move organism 1 mm.
Virulent	Non-virulent	
8	0	2 to 3 seconds
23	6	3 to 4 seconds
21	8	4 to 5 seconds
4	5	5 to 6 seconds
0	12	6 through 15 seconds

It will be observed in Table I that 8 mobilities of from 2 to 3 seconds checked with the virulent animal test, while 12 of 6 seconds and over checked with the non-virulent test. However, in the intermediate zone, 3 to 6 seconds, 48 gave a positive and 19 a negative skin test.

The 67 readings between 3 and 6 seconds could not be interpreted in terms of virulence without the animal tests. Virulent strains tend to fall in the fast readings while non-virulent increase as mobility decreases. This confirms in part the principle of electrophoresis, but since virulent and non-virulent are not sharply divided, there is no differential zone to determine electrophoretically one from the other.

TABLE II

SHOWING FAILURE OF PURE DIPHTHERIA-LIKE ORGANISMS SUSPENDED IN PHYSIOLOGICAL SALT SOLUTION TO REACT INTRACUTANEOUSLY AS VIRULENT

Cavy Number*	1			2					3				4	
Strain Number	119	Wh10	387	250	8	260	113	221	270	260	778	119	45A	45B
Reaction (necrosis) as a field culture	NN	X	X	X	X	PN	X	X	PN	PN	NN	NN	PN	PN
Reaction (necrosis) as a pure culture	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN	NN

PN: Positive Necrosis—NN: Negative Necrosis—X: Not Tested

* All 4 cavies died within 48 hours with lesions typical of toxin poisoning. No antitoxin was given as a protective dose, since occasionally reactions were aborted by its use.

Other factors that lessen the practicability of this postulated principle include the age of the culture, the reaction and temperature of the distilled water, and its varying condition due to dissolved atmospheric gases or substances from the glassware, age of the suspension, and the difficulty of isolating pure cultures. Since there are no characteristic differences between colonies of virulent and non-virulent organisms, and a field culture can include both types, picking a virulent one is purely a matter of chance.

Falk and his associates checked their electrical readings by the subcutaneous animal test. We first attempted to check ours by the skin test.

As some of the strains in Table II were from severe clinical cases of diphtheria, it seemed evident that the intradermal test would not apply to pure cultures. In seeking an explanation of this, our experiments resulted in the development of a suspending medium in which toxic strains in pure culture would produce necrosis.

TABLE III

AGAR-PEPTONE-BROTH SUSPENSION OF PURE DIPHTHERIA-LIKE ORGANISMS INOCULATED WITH AND WITHOUT A PROTECTIVE DOSE OF ANTITOXIN

Strain No.	* Antitoxin used	Saline suspended	Agar-peptone-broth	
1196	No antitoxin given	No effect	Congestion	Cavy died in 24 hours
Dr. F5		No effect	Congestion	
263		No effect	Congestion	
30		No effect	Congestion	
1196	500 units given after test had been on for 4 hours	No effect	Necrosis	Cavy lived
Dr. F5		No effect	Necrosis	
263		No effect	Necrosis	
30		No effect	Necrosis	
1196	500 units given 4 hours before testing	No effect	Normal	Cavy lived
Dr. F5		No effect	Normal	
263		No effect	Normal	
30		No effect	Normal	

* Several tests were made to determine how many units of antitoxin were necessary to save the animal without affecting seriously the local reaction. Five hundred units gave the best results.

TABLE IV

FIELD CULTURES SUSPENDED IN SALINE AND IN AGAR-PEPTONE-BROTH
500 UNITS OF ANTITOXIN ADMINISTERED 4 HOURS AFTER INJECTION
CONTROL ANIMALS NORMAL

Cavy No. 13		
March 9, 1928		
Strain No.	Agar-peptone-broth	Physiological salt solution
252 (mixed)	Pronounced necrosis	Negative
253 (mixed)	Pronounced necrosis	Negative
244 (mixed)	Negative necrosis	Negative
1196 (pure)	Pronounced necrosis	Negative
Cavy No. 14		
March 9, 1928		
242 (mixed)	Pronounced necrosis	Negative
245 (mixed)	Pronounced necrosis	Negative
154 (mixed)	Negative necrosis	Negative
Dr. F5 (pure)	Pronounced necrosis	Negative

As all cavies not protected with antitoxin died with post-mortem evidence of toxin poisoning, it appeared desirable to test *pure* cultures from 2 known positive field cases and 2 unknown. One hundred units of antitoxin were used on one test animal, the second receiving none. The protected pig failed to react with any strain as positive, while the unprotected pig was dead within 48 hours, showing pronounced subcutaneous edema, and adrenals a mahogany red. It was apparent, then, that at least one of these pure strains was toxicogenic but had failed to induce necrosis.

Various substances such as peptone induce local congestion through positive chemotaxis. Incorporation of peptone in the suspending inoculating fluid was tried, the result being slight congestion which did not persist long enough to develop necrosis. Experiments with various formulas designed to hold the inoculum mechanically at the site of injection developed the information which follows.

In *Formula C* peptone is used both as a nutrient for organisms and as a stimulant to induce the necessary local congestion. Agar is

Formula C—Stone-Weigel Virulence Test Suspending Medium (Agar-peptone-broth)

Oven dried agar	0.2%	0.2 gm.
Water to make		100 c.c.
Boil briskly to dissolve agar; then add:		
Peptone (Witte's)	4.0%	4.0 gm.
Sodium chloride (C.P.)	0.5%	0.5 gm.
Beef extract (Difco)	0.3%	0.3 gm.
Dextrose (Difco)	0.2%	0.2 gm.
Boil at this stage in double cooker.		
Adjust to pH 7.0		
Then add n/1 Na(OH)	0.7%	0.7 c.c.

Sterilize at 15 lb. pressure for 30 minutes, after tubing; 1 c.c. per tube. Cork tubes and seal with paraffine. Care must be taken to prevent evaporation of stored medium, since a very slight concentration increases the percentage of agar sufficiently to solidify the fluid. Different lots of shredded agar vary in "setting" property; so each new lot should be tested.

absorbed slowly. This prolongs the period of local congestion. Other ingredients favor active production of toxin within the tissue.

The following experiment substantiates our belief that pure cultures of *B. diphtheriae,* suspended in saline with pyogenic organisms, would produce necrosis intradermally, but not alone, and that *Formula C* combined with pure diphtheria organisms would give as good a reaction as would occur with mixed cultures. These tests were all made upon one guinea pig. A protective dose of antitoxin was administered 4 hours later.

Intradermal Injection of:

Salt solution	Negative skin reaction
Agar-peptone-broth	Negative skin reaction
Staphylococci in saline	Negative skin reaction
Streptococci in saline	Negative skin reaction
B. diphtheriae (No. 1196) in saline	Negative skin reaction
B. diphtheriae (No. 1196) with staphylococci in saline	Necrosis
B. diphtheriae (No. 1196) with streptococci in saline	Necrosis
B. diphtheriae (No. 1196) in agar-peptone-broth	Necrosis

The following experiment is representative of many tests with new strains isolated day by day. These gave conclusive assurance that the agar-peptone-broth method was practical for pure cultures.

Giving a relatively large dose of antitoxin was a safe practice where agar-peptone-broth was used for suspension. *Saline* suspensions of pure or field cultures were inhibited when antitoxin was used. The application of agar-peptone-broth suspension to field cultures was a natural sequel to its successful use with pure cultures. Experiments on 90 field cultures using saline and agar-peptone-broth suspensions provided unmistakable evidence of the superiority of the new medium over salt solution.

Further experiments demonstrated that agar-peptone-broth permitted the use of a relatively larger dosage of antitoxin than was pos-

sible with saline without interfering appreciably with the local reaction (necrosis). See Table V.

Cary[4] and others have pointed out that the virulence of an organism and its active toxicogenicity are not necessarily correlated. Strain Park No. 8 of *B. diphtheriae* is highly toxicogenic but of low virulence. In our system of intradermal testing, any pure strain producing necrosis should produce a soluble toxin in broth; any not producing necrosis should be non-toxicogenic. To confirm the reliability of skin reactions as a test of virulence 37 pure strains were tested as saline suspensions, agar-peptone-broth suspensions and as toxic broth filtrates. The demonstration of toxin in a Berkefeld filtrate was necessary, but the production of a powerful toxin *in vitro* was not desirable since test animals might be killed before skin reactions could be read. *B. diphtheriae* grown 6 days in the following medium produced a toxin which caused necrosis intracutaneously in one minim doses. Pigs protected with antitoxin remained normal.

Beef extract broth for toxin production:

2% Witte's peptone
0.3% beef extract (Difco)
Distilled water to make 1 liter
Adjust to pH 7.0 and add 7 ml. per liter of n/1 Na(OH)
Sterilize 15 lbs. for 30 minutes

The 37 pure cultures were grown in this broth, killed by addition of 0.4 c.c. of 5 per cent phenol, and passed through Berkefeld filters.

TABLE V

	Cavy No. 15	Cavy No. 16	Cavy No. 17	Control
Mixed Field Culture No.	Saline suspended—no antitoxin given for protection of test animal	Saline suspended—100 units of antitoxin given 4 hours *after* inoculation	Agar-peptone-broth suspended—500 units of antitoxin given 4 hours *after* inoculation	Agar-peptone-broth suspended—500 units of antitoxin given 4 hours *before* inoculation
422	Animal was dead within *36 hours.* Post-mortem showed subcutaneous edema and congested adrenals. Heart blood sterile.	No reaction	*Necrosis*	Normal at end of 72 hours.
357		No reaction	No reaction	
407		Slight welt	*Pronounced Necrosis*	
447		No reaction	No reaction	
395		Slight welt	*Pronounced Necrosis*	
434		No reaction	No reaction	
433		No reaction	No reaction	

They were tested in saline, agar-peptone-broth, and as toxin filtrates. The saline suspended failed to react in conjunction with 500 units of antitoxin. Twenty-one cultures reacted as positive in agar-peptone-broth and as toxin filtrates; 13 were negative by all three tests; 1 toxin filtrate became contaminated and did not react, though the agar-peptone-broth reaction was positive; 1 toxin filtrate gave a very faint reaction, whereas the culture in agar-peptone-broth was negative; 1 culture produced a slight necrosis whereas its filtrate was negative.

Table VI gives the result of 4 cultures representative of this series.

TABLE VI *

Strain Number	422	407	432	253	Cavy No.
Reaction of field culture suspended in saline	Neg.	Neg.	Neg.	Neg.	18
Reaction of field culture suspended in agar-peptone-broth	Pos.	Pos.	Neg.	Pos.	19
Reaction of *Pure* culture suspended in saline	Neg.	Neg.	Neg.	Neg.	21
Reaction of *Pure* culture suspended in agar-peptone-broth	Pos.	Pos.	Neg.	Pos.	20
Toxin filtrate of pure culture	Pos.	Pos.	Neg.	Pos.	23
Pure culture *Control* in agar-peptone-broth (500 units of antitoxin 4 hours previous to test)	Neg.	Neg.	Neg.	Neg.	22

* Photographic reproductions of guinea pig numbers 20, 21 and 22 are representative of the reactions obtained throughout these tests.

SUMMARY

Virulence tests are reviewed briefly with citations of certain limitations in present accepted procedures.

Electrophoresis as advanced by Falk and his coworkers is compared with actual intradermal tests on guinea pigs. Eighty-seven pure cultures studied demonstrate the impracticability of applying the test to routine public health control practice.

The intradermal test with pure cultures does not produce necrosis when salt solution is used for suspension.

Agar-peptone-broth aids in the production of excellent intracutaneous reactions with pure cultures.

Animal inoculations of agar-peptone-broth with mixed field cultures give reactions superior to those produced with the same field cultures in other suspensions.

Comparative experiments show that necrosis production *in vivo* by the Stone-Weigel method parallels toxin production *in vitro*.

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THE VERNES FLOCCULATION TEST FOR THE DIAGNOSIS OF SYPHILIS

DESPITE the great number of articles that continue to appear on the technical and clinical aspects of the various serological tests for syphilis, there is very little recent reference in English or American literature to the Vernes flocculation or " photometric " test. This lack of comment is undoubtedly due to the mechanically elaborate technic of the test, as well as to the difficulties of interpreting the results. Indeed, it involves not only a modification of the classic precipitation reaction between syphilitic serum and lipoid extractives, but an entire elaborate system of serum diagnosis and serum-controlled therapy.

The conditions under which serum and lipoid antigen are mixed are such as to yield not a sharp contrast between a precipitate or a high degree of turbidity for the reaction with syphilitic serums on the one hand, and a clear or opalescent solution for non-syphilitic serums on the other hand, but slight differences in the turbidity of the serum-antigen mixture, detectable when the mixture is examined with a special optical instrument, the Vernes photometer. Low readings on the turbidity scale are found in general in non-syphilitic cases, and high readings in syphilitic cases. The turbidity readings that fall between these extremes are found to occur in both syphilitic and non-syphilitic cases, the proportion of the former increasing with increase in the turbidity readings. This elaborate system of serum diagnosis is based on the contention that in the absence of syphilis the turbidity reading is a constant value for each individual, but may vary from individual to individual. The presence of a syphilitic infection causes this value to increase, the course of the disease being accompanied by variations in the Vernes reading. A low reading before treatment will, for ex-

ample, be accompanied by a higher reading after a provocative treatment. The value of the reading should, according to Vernes, decrease to the normal constant value for the particular individual, if treatment is correctly administered over a sufficiently long period of time.

The Vernes system thus admits of no absolute positive or negative report for a single test, nor can the readings be readily interpreted in terms of the accepted + + + + scale of the Wassermann reaction. The burden of interpretation becomes a matter of *probability* for a single reaction, and of *variability* or *constancy* as influenced by antiluetic treatment for repeated tests. Indeed a single moderately low Vernes reading cannot be classed as a negative reaction unless it is known to coincide approximately with the normal Vernes reading of the patient in question, a criterion which it is obviously impossible to apply in many cases.

By thus contriving to express the serum reaction in terms of quantitative variations of a qualitatively continuous property of syphilitic and non-syphilitic serum, Vernes has made a distinct serological contribution. The principle on which his test is based, and the procedures involved, might lend themselves to special theoretical studies on the chemical and colloidal changes in the serum that affect the reaction with lipoid antigen.

From a practical viewpoint, the Vernes test seems to have several distinct limitations. In the first place the test is very complicated in technic and requires a relatively large amount of serum, at least 15 c.c. and preferably 20 c.c. of blood being specified. Furthermore, the very quality of indefiniteness, in which lies its theoretical significance, seems to detract from the practical applicability of the test for diagnostic purposes. Most of the published studies deal in great detail with the syphilometric analysis of a few cases, relatively few summarizing tables being available in which the serological results with this method are compared with the clinical findings in a large number of cases. As an exception may be quoted the recent report of the serological conference held at Copenhagen in June, 1928, under the auspices of the League of Nations Health Committee. The data furnished in this report show that in a group of about 500 serums from syphilitic cases, the Vernes test returned 40 per cent positive, 14 per cent doubtful, and 46 per cent negative reactions. The most satisfactory Wassermann method tested at the conference showed on the same group of serums 42 per cent positive, 15 per cent doubtful, and 43 per cent negative reactions, while the best of the precipitation methods tried gave 61 per cent positive, 7 per cent doubtful, and 32 per cent negative reactions. At the same time in a group of about 400

specimens from non-syphilitic cases, the Vernes test returned 0.5 per cent positive, 10.2 per cent doubtful, and 89.3 per cent negative reactions. The Wassermann test gave no positive, 2.8 per cent doubtful, and 97.2 per cent negative reactions, and the precipitation test above referred to gave no positive, 1 per cent doubtful, and 99 per cent negative reactions. The Vernes test thus seems to be less sensitive than a satisfactory precipitation test, and less specific than either a good Wassermann or a good precipitation test.

THE CHAMBER OF COMMERCE AND HEALTH CONSERVATION

THE Chamber of Commerce of the United States of America at its Seventeenth Annual Meeting adopted a resolution which stated:

> The gratifying progress of recent years in extending the average span of human life gives good reason to expect further advance through concerted efforts, both for health conservation and for prevention of accidents which are constantly growing and cause the premature death annually of thousands of our citizens. In order to conserve life and health to the fullest extent there should be further development of national interest and of national activity. In efforts directed to this purpose the Chamber should participate and should enlist the widest possible coöperation on the part of its membership.

As a means of creating a nation-wide interest in health development the Chamber of Commerce has instituted a Health Conservation Contest among its member organizations and has asked the Committee on Administrative Practice of our Association to act in an advisory capacity. This contest, conducted as it will be by a responsible organization, should tend to arouse community interest and improved understanding, thus meeting fundamental need.

The Executive Board at its meeting on December 8, 1928, voted to approve of the coöperative undertaking by which the Committee on Administrative Practice will serve as technical advisers in the Health Conservation Contest carried out by the Chamber of Commerce.

In his greetings to the health officers called together by the Committee on Administrative Practice with reference to this activity, William Butterworth, President of the Chamber of Commerce, stated:

> The object of the competition as outlined is to assist in reducing economic losses in the United States due to unnecessary illness and premature death by means of activities carried on by local chambers of commerce or similar associations in cooperation with their official health agencies. It is now known that at least 130 chambers of commerce have active committees engaged in health conservation work, and, accordingly, the contest is designed to give recognition and credit to the work of these committees as well as those that will undertake activities of a health nature in the future.

The Committee on Administrative Practice of the American Public Health Association through the studies of public health administration and work on appraisal of city health service is in a position to advise the Chamber of Commerce, with the best interests of the profession and of public health promotion in mind.

The service plan for this technical coöperation is twofold in purpose: (1) supplying technical aid on request of the local health officer; and (2) the appraisal or evaluation of the health work and its collateral activities in a particular city.

The hope is to arouse the interest of the local citizens and crystallize their attention in such a manner that the important men and women as well as organizations will assume a greater interest, give more intelligent knowledge, and develop a sympathetic appreciation of the problems and program of their health officer, so that eventually they will constitute themselves real and vital factors in relation to health questions and their solution.

When committees of chambers of commerce and civic groups in general become interested in the health department, when mortality rates—rates incident to preventable illness, accidents and to physical disability—assume a definite meaning to these organizations and groups, then the economic disadvantages of higher rates will become readily apparent. The per capita appropriation for health work will then be a subject of study and we may look for and anticipate more comprehensive and intelligent budgeting. The business instinct of such a community can be relied upon to assert itself and the essential funds for a well defined health program will be more readily obtainable.

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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

How Many Scarlet Fever Exposures Contract the Disease?—During the two years 1927 and 1928, there were in Detroit 7,967 cases of scarlet fever, 6,615 of which were primary cases and 1,352 secondary cases. To these 6,615 primary cases there were 10,888 presumably susceptible immediate family contacts, or 1.64 contacts per case. In all, 12.4 per cent of these contacts, or 1,352, contracted scarlet fever. While 12.4 per cent was the average of secondary cases to contacts, there was wide variation in the secondary case rates dependent primarily upon the length of time the contacts were exposed to the disease. Secondary cases ranged from 19 per cent where the contacts remained at home with the patient, to 3.95 per cent among contacts removed to adult friends' homes. In all 2,970, or 44.9 per cent, of the primary cases were hospitalized. Of the contacts to these hospitalized cases 10.7 per cent developed scarlet fever while 14.5 per cent of those exposed to cases cared for at home developed the disease.

Table I gives the disposition of immediate family presumably susceptible contacts and the number of secondary cases developing among them.

From these figures we may conclude that if a member of your family contracts scarlet fever and you are under 16 years of age and have not had the disease, or a negative Dick test, your chances of avoiding the disease are best if you go to stay with some adult friend. You are approximately 5 times as likely to get scarlet fever if you stay at home with the patient. If you are unable to visit an adult friend but will

TABLE I

DETROIT SCARLET FEVER CASES IN 1927 AND 1928

Where Case Was Cared For	Primary Cases	Susceptible Family Contacts *	Secondary Cases	Per Cent of Contacts Contracting the Disease
Cared for in the hospital—Case removed within 3 days of onset	2,130	4,150	224	5.39
Cared for in the hospital—Case removed more than 3 days after onset	840	1,874	266	14.19
Secondary cases occurring after patient returned from hospital		5,534	155	2.80
Total cases cared for in the hospital	2,970	6,024	645	10.70
Case cared for at home. Contacts removed to adult friends' home	776	1,465	58	3.95
Cared for at home—Contacts at home with the patient	2,869	3,399	649	19.09
Total cases cared for at home	3,645	4,864	707	14.53
Grand Totals	6,615	10,888	1,352	12.41

* Members of the immediate household who are under 16 years of age and who have not had scarlet fever. Our assumption that they are susceptible is, of course, in that they have not been Dick tested.

have the sick person sent to the hospital as early as possible, your chances of getting the disease are only a little over 5 out of 100. If all contacts had gone to live with adult friends, there would have been 922 less secondary cases than actually occurred.

One might conclude that since only 12.4 per cent of family contacts under 16 years of age contract scarlet fever, the disease is not a highly communicable one. This assumption is, however, incorrect in that many of these contacts, whom we have presumed to be susceptible in the absence of any definite information to the contrary, are really not susceptible. During 1927 Dick tests made on 1,076 children under 16 years of age who had not previously had scarlet fever showed that only 291 or 27.04 per cent were susceptible. If we assume that 30 per cent of these contacts are susceptible, we change our number of susceptible contacts from 10,888 to 3,266 and our secondary case rate becomes 41.4 per cent instead of 12.4 We may conclude that while a great many people are not susceptible to scarlet fever, if you are susceptible to it and are exposed, you are quite likely to contract the disease. Of the 1,020 susceptible contacts (30 per cent of 3,399) who stayed at home with the patient, 649 or 63.6 per cent contracted scarlet fever.—*Weekly Health Rev.*—Detroit Dept. of Health, Aug. 10, 1929.

Venereal Disease Reporting in Philadelphia—Venereal diseases were made reportable in this city in 1918. Provisions were made for reporting by serial number in private cases and by name and address in institutional and clinic cases. Official records of cases reported were declared private and confidential, not accessible to the public or any person other than the official custodian of the same. Infectious cases, delinquent in treatment or otherwise constituting a public health menace, were made reportable and subjected to special investigation and disposition.

Such cases are reclaimed to treatment at sources of reporting, placarded and quarantined at home or removed to the Philadelphia General Hospital and there quarantined. Suspected and clandestine cases are investigated and properly disposed of from a public health standpoint. Every effort is made to identify sources of infection to known cases and when discovered, they are forthwith placed under immediate control. Home contacts are routinely investigated and examined for evidences of disease.

Introduced as a World War measure, under governmental supervision, the reporting and control of venereal disease came in on a popular wave. Following the return to peace these activities were sustained through the educational propaganda and vice repressive measures of the federal government in coöperation with the states. However, within recent years there has been an apparent slowing-up in these activities. The reporting of cases involving control has marked time or been actually diminished all over the country. In Philadelphia the following yearly case figures serve to illustrate this:

Year	*Cases*	*Population*
1918	1,833	1,781,346
1919	3,748	1,809,635
1920	2,716	1,837,924
1926	2,597	2,007,652
1927	2,918	2,036,000
1928	2,885	2,064,288

It may be conceded that the incidence trend of venereal diseases is on the decline, but not to the extent indicated by the reduction in the number of case reports. It has been estimated that about 60 per cent of cases of syphilis and 75 per cent of cases of gonorrhea are under treatment by the private physician. In this city only 17 per cent of the total number of cases reported are received

from the private physician. The World War case rate given this city was 37.3 per 1,000 population and the nearest approximation to this figure was 2.10 in 1919, and 1.44 per 1,000 in 1928.

It is evident that venereal disease case reporting in Philadelphia is not popular and certainly does not approximate the incidence of these diseases in a community of 2,000,000 inhabitants. As in the other communicable diseases, the health officer should be supplied with data on prevalence, geographical distribution, focuses of infection, etc., in order intelligently to direct measures for control. Such data can be supplied only by the reporting physician, and there should be no hesitancy on his part or on the part of the patient to comply with the law. The law not only protects the identity of the patient conforming thereto, but at the same time protects the innocent public from a potential focus of infection.—*Healthfax*, Philadelphia Dept. of Health, July 22, 1929.

LABORATORY

C. C. YOUNG

THE DEATH OF ANIMALS FOLLOWING INOCULATION WITH *B. SUBTILIS* OR SIMILAR BACILLI

RUTH GILBERT, M. D., AND MARION B. COLEMAN

Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

WHEN wool, bristles, or other animal products are examined for the presence of anthrax spores, it is customary to inoculate mice or guinea pigs subcutaneously with washings or with cultures made from the specimens. If *B. subtilis* or similar bacilli are present in large numbers in the inoculum and some of the material accidentally enters the peritoneum, the animals may die, and even though the presence of *B. anthracis* cannot be demonstrated in the specimens studied, stained preparations made at autopsy from the spleens of such animals may contain numerous large Gram-positive bacilli.

In 1923, a man who had carried bales of wool for delivery to a factory developed anthrax. Wool from one of the bales thought to have been handled by the patient together with burlap from the wrapper was delivered to the Division of Laboratories and Research for examination. Pieces of the burlap and masses of wool were placed in broth, incubated overnight, and guinea pigs and mice were inoculated with the cultures. The next day the mouse inoculated with the growth from the burlap was found dead and the examination of film preparations made from the spleen showed bacilli very closely resembling *B. anthracis*. Cultures from the heart's blood and spleen of this animal, however, were found to contain motile bacilli. No evidence of the presence of anthrax spores could be demonstrated in the wool or burlap submitted.

A number of cases of anthrax developed among employees of a carpet factory in another locality, in 1928. Samples of wool used at the factory as well

as material from some of the cases of anthrax were examined at a local laboratory where it was reported that anthrax bacilli were isolated in a number of instances.

Seven of the cultures from these specimens were received at the laboratory in Albany for confirmatory examination. The bacteria present in 5 of them were nonmotile and proved to be *B. anthracis,* and 2 contained motile bacilli.

Another culture isolated from a lesion on the arm of a man who had been in an automobile accident was also submitted from the same laboratory. This culture was described as being similar to *B. anthracis* in morphology, with many of its cultural characteristics, and was said to have proved virulent for two mice. It was found to contain motile bacilli, and a guinea pig inoculated subcutaneously with 1 c.c. of a heavy suspension of the organism showed no signs of illness.

The cultures of large Gram-positive spore-bearing bacilli isolated from the various sources mentioned resembled *B. subtilis* morphologically, but they did not correspond to it exactly in all of their cultural characteristics. Mice and guinea pigs are killed when inoculated intraperitoneally with 0.5 c.c. and 2.0 c.c. amounts, respectively, of a broth culture of *B. subtilis* and the bacilli can be isolated from the heart's blood. Mice were killed by all of the strains of the Gram-positive bacilli studied when inoculated intraperitoneally with an 0.5 c.c. amount of a 6-hour broth culture, while a similar dose given subcutaneously was not found to be pathogenic for them.

This experience demonstrates that in the inoculation of animals with material to be examined for anthrax spores, it is well to make the injections subcutaneously on the thigh, or in some position where there will be no danger of the material entering the peritoneal cavity. In case the inoculated animal dies, it is important to make morphological and cultural examinations for the purpose of demonstrating that the bacteria are nonmotile and correspond in other respects to *B. anthracis.*

THE "STAINED SLIDE" MICROSCOPIC AGGLUTINATION TEST

Its Application to (1) Rapid Typing of Pneumococci, (2) Determination of Antibody

ALBERT B. SABIN

Littauer Pneumonia Research Fund of New York University and the Department of Bacteriology of the New York University Medical School, New York, N. Y.

THE microscopic method to demonstrate the agglutination reaction with minute amounts of serum and organisms has been found to give reliable results. The test is performed by mixing a suspension of organisms with the immune serum on a glass slide, allowing it to dry rapidly and treating the film with a suitable stain. Agglutination in this reaction apparently occurs within half a minute, and the process has then progressed sufficiently to be observed without difficulty with oil-immersion, lens magnification. Many investigators have made stained preparations of bacteria that were previously agglutinated

either grossly in tubes or by the microscopic hanging-drop method. Neufeld (*Ztschr. f. Hyg. u. Infectionskrankh.*, 1902, xl: 54) studied microscopically the reaction between pneumococci and their homologous serums. He observed a specific reaction, characterized not only by agglutination but also by swelling of the peripheral portion of the organisms, i.e., the capsule. He also demonstrated that the peripheral swelling never led to the dissolution of the bacteria, and that it was not a bacteriolytic process. He thought that this specific reaction could be observed only in the moist state without fixation, and therefore found it unsatisfactory for practical application. A specific reaction may also be observed after drying in air, and the resulting picture resembles that obtained by Neufeld by the moist cover-slip method. The organisms are found in clumps of varying size, each embedded in a deeply staining, homogenous zone. Neufeld's explanation of a swelling of the capsule seems dubious in the light of recent work on agglutination, and it seems more likely that the zone surrounding the bacteria represents a precipitation of antibody-bearing protein on the periphery of the organisms. Saline suspensions of killed pneumococci, broth culture, colonies from blood agar plates and organisms from the mouse's peritoneum were found to give the reaction equally well. There was no disagreement in the typing of pneumococcus obtained by this method with that obtained by the old macroscopic tube agglutination, provided the test was carried out on the same material.

The importance of obtaining an early diagnosis of the type of infecting pneumococcus, especially in cases of lobar pneumonia to be treated with serum, has resulted in the development of many methods. The microscopic agglutination test just described, since it required very few organisms, was expected to reduce the time for a determination of type. Attempts to type the organisms directly from the sputum were unsuccessful. The fact that in the microscopic test the sputum was exposed to the immune serum for a very short time only, was at first thought to be responsible for the negative results. Small amounts of sputum were accordingly mixed with varying amounts of serum, and incubated in sealed capillary tubes at 37° C. for different periods of time; these mixtures were subsequently smeared and stained. The unsuccessful results are due possibly to the presence of some interfering factor or unfavorable physical conditions in the substance in which the pneumococci are coughed up. Most of the sputa injected in the mouse's peritoneum are digested within 2 hours, and in 3 to 4 hours sufficient organisms may be found to carry out a microscopic typing test. Broth may be used as a culture medium in the absence of mice, but the mouse is preferred because its peritoneum is somewhat selective for pneumococci, and because results can be obtained in a shorter time.

The procedure for microscopic typing is as follows: One c.c. of a fresh sample of sputum is injected intraperitoneally into a mouse; 3 to 4 hours after injection some of the peritoneal fluid is obtained by capillary puncture. A glass slide is marked off into 4 parts, and a minute drop of the peritoneal fluid is expelled upon each one of the 4 partitions. The first is smeared with saline for control, and the others with a loopful of a 1–10 dilution of Type I, of Type II, and of Type III, diagnostic serums respectively. This dilution of serum is chosen largely to eliminate group agglutinins. The smears are made thin, so that they dry rapidly; they are then stained for ½ minute with a fuchsin solution (10 c.c. saturated alcoholic solution of basic fuchsin plus 90 c.c. distilled water). The stain is

washed off in running water, and the smears are examined with the oil-immersion lens. If a specific agglutination reaction is observed in one of the smears with diagnostic serum, the organism is of the corresponding type. If no reaction occurs in any of the smears, and pneumococci are clearly seen, a diagnosis of group IV is made. When it is desired to know whether the organism is one of the fixed types of group IV, a similar procedure is carried out with the corresponding diagnostic serums. Naturally occurring clumps of organisms differ in appearance from those produced by specific agglutination; they can be recognized by their occurrence in the saline control smear as well. Unless a fresh sample of sputum is used, many of the organisms will have undergone autolysis and therefore more time must be allowed for growth. Since the mouse is not killed, another typing can be done if the first one should show insufficient organisms, and after death of the mouse the type may be confirmed. In the case of Type III, sufficient organisms for a microscopic typing are present as early as 2 hours after injection. The appearance of the specific reaction with Type III differs from that obtained with other types of pneumococci, primarily on account of the larger size of the capsule. More than 400 cases have already been typed by this method at the Harlem Hospital with perfect agreement as compared with the results obtained by the older methods.

MICROSCOPIC ANTIBODY TEST

It has been suggested (Park and Cooper) that the dosage of antipneumococcus serum be controlled by an antibody test on patient's blood. Taking advantage of the fact that the microscopic agglutination test requires only minute amounts of serum, it was performed on patients who had just recovered from lobar pneumonia or whose blood had been rendered anti-bacterial by therapeutic administration. Positive tests were obtained only against the homologous types of pneumococci. The technic for carrying out the microscopic antibody test is as follows:

A drop or more of the patient's blood is taken with a capillary. This is either centrifuged or, after coagulation and synaeresis, a minute amount of serum is smeared with a loopful of a heat-killed, saline suspension of the type of pneumococcus for which it is desired to determine agglutinins. The drops are thoroughly mixed and smeared very thin; allowed to dry in air; and stained for ½ minute with the fuchsin solution recommended for the microscopic typing test. The specific agglutination reaction is obtained here, but the clumps tend to be smaller.

The sensitivity of this method was compared with the rapid macroscopic method of Arlyle Noble (*J. Bact.*, XIV: 287, 1927) and the regular macroscopic tube agglutination, and it was found to be 2½ to 3 times as sensitive as either of the other methods when a standard diagnostic serum was used for the comparison.

Observations, which aim to establish with the aid of the microscopic antibody test a more exact guide for the administration of antipneumococcus serums, are being collected at Harlem Hospital.

The microscopic agglutination reaction has also been tried successfully with *B. typhosus* and meningococcus. Probably it may be applied as well wherever the older methods of demonstrating agglutination are used, and more advantageously in many instances where, without loss of time, the older methods are either unsatisfactory or impossible.

NOTE: I wish to thank Dr. William H. Park and Dr. Jesse G. M. Bullowa for their kind coöperation and numerous valuable suggestions.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Heart Disease among Children and Young Adults—The crude death rate from organic heart disease has been slowly increasing. But when the mortality data for the various age groups are considered, it is found that the rise in the rate applies only to the higher age groups. Distinct improvement has taken place in recent years in childhood, adolescence, and in early adult life. Among the industrial policy holders of the Metropolitan Life Insurance Company the death rate from heart disease decreased from 24.8 per 100,000 in 1911, to 14.4 in 1928 for the ages 10 to 14 among males, and from 33.1 to 20.1 among females; in the 20 to 24-year group the rates decreased from 33.4 to 24.4 among males, and from 38.9 to 26.8 among females; in the 25 to 34-year group there was a decrease from 58.1 to 40.3 among males, and from 53.0 to 37.7 among females; and in the 45 to 54-year group there was an increase in the death rate from 288.6 in 1911, to 354.7 in 1928 among males, and from 236.0 to 252.4 among females. A rise in the death rates is shown for the 65 to 74-year group. In 1911 the rate for males was 1,649.5, as compared with 1,986.2 in 1928, and for females 1,422.8, as compared with 1,711.4. The fact that heart disease mortality is increasing after age 65 is not discouraging, since this is the age-range when approximately 60 per cent of the deaths from chronic cardiac conditions occur.—*Stat. Bull.*, Met. Life Ins. Co., 10: 1–4 (June), 1929.

Ten-Year Program for Children in Massachusetts—Since 1924 approximately 100,000 children have been examined in Massachusetts. It was found that infection with the tubercle bacillus is not as common as had been supposed. An analysis of the records showed that when children begin school life 20 per cent are infected. At age 10 approximately 28 per cent are infected, and at 15 years of age about 35 per cent are infected. Children are infected with the tubercle bacillus to the same degree regardless of nutrition or nationality if they are exposed to an open case of tuberculosis. Fifty per cent of the children who were said to be contacts reacted to the tuberculin test. It was found that children with extensive tracheobronchial glands and calcified nodules in the lungs often developed the adult pulmonary type of disease a few years later. By use of the tuberculin test it was discovered that only about one-third of the diseased cervical glands are tuberculous.

In the future the clinic will reverse the procedure that has been in use. The tuberculin test will first be given. All reactors will be X-rayed. Those showing evidence of tuberculosis or other pulmonary conditions in the X-ray film will be examined by a physician of the clinic.—Henry D. Chadwick, *New England J. Med.*, 200: 1,154–1,155 (May 30), 1929.

Scarlet Fever Carriers among School Children—Cultural examinations for hemolytic streptococcus were made on groups of school children in Arlington and Dedham, Mass. In the Junior High East School in Arlington, scarlet fever had been prevalent in the school district and 4 pupils were absent with the disease. Among the pupils of

the Junior High West School scarlet fever had prevailed in the school district, but not in the school. The disease was absent from both the Parmenter Grade School and the district. In the Dedham School and district the incidence of scarlet fever had been very high, with no reported cases for the previous 6 months. There were 297 children examined in the four schools, and 40, or 13 per cent, were found to be carriers. Of these, 33 said that they had never had scarlet fever. In the Junior High East School 11 per cent of the 97 children examined were carriers. Eight of these had never had the disease. In the Junior High West School 8 per cent of 50 examined were carriers, and in the Parmenter School 10 per cent of 50 examined were carriers. Twenty per cent of the 100 children examined in the Dedham School were found to be carriers, and 18 of these had never had scarlet fever. In the Junior High West and the Parmenter Schools the additional information relative to previous tonsillectomy was obtained. Seven, or 14 per cent, of the carriers were children whose tonsils had not been removed, while 2, or 14 per cent, were those whose tonsils had been removed.—E. A. Lane and E. A. Beckler, Carriers of Streptococcus Hemolyticus in Relation to Control of Scarlet Fever in School, *New England J. Med.*, 200: 1,283–1,284 (June 20), 1929.

Typhoid Fever in 1928—The Health Section of the League of Nations reports that during 1928 typhoid morbidity fell considerably in a number of countries. Notable among these was Germany, where there has been a steady decrease for 4 years. The number of cases dropped from 17,367 in 1925 to 7,068 in 1928. In the European part of the R. F. S. F. R. (Soviet Russia) there has been a continuous decrease since 1925 when the typhoid morbidity reached the high level of 105,062 cases. The figure of 39,445 cases for 1928 is the lowest recorded for several years. The United States also shows a steady decline in typhoid fever. In 1928, 24,335 cases were reported from 47 states. In 1925 there were 45,995 cases reported, and in 1927, 34,411 cases. Countries which showed a considerable decrease in 1928 as compared with 1927 were Bulgaria with 2,467 and 4,012 cases, respectively; Czechoslovakia with 7,795 and 8,020 cases, respectively; and Italy with 34,708 and 39,894 cases, respectively. The general decrease in the prevalence of typhoid fever in Europe may be attributed mainly to the improvement in water supply since the war. Countries where the prevalence of typhoid fever increased were: Denmark with 413 cases in 1928, as compared with 278 in 1927; France with 9,762 cases in 1928, as compared with 7,438 in 1927; and Hungary with 9,822 cases in 1928, as compared with 7,265 in 1927. In Japan the position has remained stationary for some years, the number of cases of typhoid fever being slightly greater in 1928 than in 1927.

There was no great change in the typhoid mortality rate for most countries in 1928, as compared with 1927. Decreases in death rates were shown for Austria with 2.5 per 100,000 population in 1927, as against 1.4 in 1928; Czechoslovakia with 8.8 in 1927, as against 7.9 in 1928; and Canada with 11.9 in 1927, as against 4.7 in 1928. A steady decrease in the typhoid death rate over a series of years is shown by several countries. In Germany the rate declined from 6.3 per 100,000 population in 1919 to 1.1 in 1928; in Austria from 9.7 to 1.4; in Portugal from 17.1 to 9.3; and in Czechoslovakia from 16.6 to 7.9. In the U. S. Registration Area the rate declined from 9.1 in 1919 to 5.5 in 1927.

The seasonal distribution of deaths from typhoid fever seems to reach a

maximum during the summer or early autumn months. This summer maximum is not, however, constant, even in countries with practically the same climate. The summer-autumn maximum is often followed by an increase in the curve of incidence of typhoid in the middle of winter, though the winter maximum scarcely ever attains the height of that in summer.—League of Nations, *Epidemiological Report,* p. 155 (May 15), 1929.

The Cancer Record of 1928—The crude death rate from cancer has been steadily increasing in the United States for the past 25 years. For 50 cities since 1906 the rate has increased from 71.6 per 100,000 population to 117.3, the highest figure thus far on record for American cities collectively considered. Of 143 cities, 83 showed an increase and 60 showed a decline in the death rate for 1928 as compared with 1927. Among the 10 cities with the highest rates for 1928 were San Diego, Calif., with a death rate of 214.7 per 100,000 population; Springfield, Ill., with a rate of 206.8; Sacramento, Calif., with a rate of 203.4; and Atlantic City, N. J., with a rate of 192.0. Of the 143 cities studied the rates in 1928 varied from 37.0 per 100,000 population in Highland Park, Mich., to 214.7 in San Diego, Calif. Cancer is apparently not influenced very much by population aggregates. Many of the largest cities in the United States have rates measurably below the general average. Detroit had a death rate of 72.4 per 100,000 in 1928; Los Angeles a rate of 91.5; and New York City a rate of 128.8.

In comparison with certain foreign countries the cancer death rate of the United States is not exceedingly high. For the year 1925 the average cancer death rate for the United States was 93 per 100,000 population. For the same year the rate for Denmark was 140; for Austria 139; and for Prussia 97. In the U. S. Registration States the general cancer death rate at ages 45 to 54 increased from 173.8 in 1920 to 185.7 per 100,000 population in 1925; at ages 55 to 64 the rate increased from 394.4 to 434.9; and at ages 75 and over the rate increased from 974.1 to 1,138.3. These figures show that the actual mortality from cancer in proportion to population is rapidly increasing irrespective of the tremendous progress which has been made in the treatment of the disease.—Frederick L. Hoffman, *Spectator,* 123: 3, 22–23 (July 11), 1929.

Congenital Syphilis among Dependent Children—A study of 1,000 children under the care of the Associated Medical Clinic in Philadelphia was made to determine the incidence of syphilis. The children studied were between 4 months and 16 years of age. Seventy-nine and one-tenth per cent were white and 20.8 per cent were colored. Definitely positive Wassermann reactions were given by 2.3 per cent of the children; 0.6 per cent gave a doubtful reaction; and 97.1 per cent gave a negative reaction. Of the 23 children with a positive reaction, 20 were cases of congenital syphilis and 3 of acquired syphilis. Forty-seven and eight-tenths per cent of the 23 children were white and 52.2 per cent were colored. The percentage incidence compared with the total number of white and negro children studied was 1.39 for the white and 5.77 for the colored children. Ten of the 23 children were within normal limits of weight; 5 were more than 7 per cent underweight; 4 were 10 per cent or more overweight, and in 4 the weight was not recorded.

A special study of 200 of the children between the ages of 4 months and 5 years showed that the incidence of syphilis in this group was 1.5 per cent. The percentage of illegitimacy in the group was strikingly high, 105, or 52.5 per

cent, of the 200 children being of illegitimate birth. Among the entire group of 1,000 children studied the percentage of illegitimacy was 17.3 per cent. The physical signs of congenital syphilis are often so obscure that it would seem advisable, at least in a clinic for dependent children, to perform a Wassermann test of the blood on every child.—H. H. Jenks and J. D. Donelly, *Am. J. Dis. Child.*, 37: 1,198–1,202 (June), 1929.

Peptic Ulcer—An analysis was made of 556 cases of gastric and duodenal ulcer admitted to the Peter Bent Brigham Hospital, Boston, Mass., from 1913 to September, 1926. Seventy-two and eight-tenths per cent of the patients were male and 27.2 per cent were female. The average age at which symptoms of ulcer were first noticed was 36.8 years. There were only 9 families in which peptic ulcer was known to exist. In addition there was a history of stomach trouble in 37, which was fatal in 19 cases. Five per cent of the patients had hypertension, and 6 per cent had generalized arteriosclerosis. No other disease occurred frequently enough in the past history to suggest an association with ulcer. The average duration of symptoms at the time of entry was 7 years. Sixty-three per cent had had symptoms for more than 2 years. Hyperacidity occurred in 50 per cent of the cases, and hemorrhage in 34.8 per cent. Cancer was found in 4.4 per cent of the cases with gastric ulcer. Twenty of the 556 patients died from ulcers; of these 8 died from hemorrhage and 6 from perforation of the ulcer without operation. Twenty-one died following an operation to cure the ulcers.

The results of treatment were observed in 460 cases which were followed for periods varying from ½ to 13 years. As a result of treatment, 37.8 per cent of the patients showed good results and 40.6 per cent were unimproved. Two hundred and forty-eight patients had surgical treatment. Of these, 44.8 per cent showed good results, as compared with 40.6 per cent who were unimproved. Medical treatment was given to 186 patients without a previous operation. The results in 29.8 per cent were satisfactory, as compared with 48.7 per cent which were unsatisfactory. The results of all forms of treatment showed that about 60 per cent of the patients were relieved after an average observation period of 4 years.

All evidence points to the fact that ulcer is a chronic disease and that all the present methods of treatment are merely palliative.—Edward S. Emery and Robert T. Monroe, *Arch. Int. Med.*, 43: 846–873 (June), 1929.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Occupational Poisoning in Manufacture of Luminous Watch Dials—This paper presents a general review of the hazard caused by the ingestion of luminous paint, with special reference to the New Jersey cases, and is reprinted from the *Journal of the American Medical Association* of February 9 and 16, 1929. This is an excellent summary of the facts concerning the radium poisoning cases in New Jersey and the various reports made on these cases by Dr. F. L. Hoffman, Drs. Castle and Drinker, Drs. Reitter and Martland, and Dr. Flinn. The report calls attention to the national survey of this problem that is being conducted by the U. S. Public Health Service.—Harrison S. Martland, M.D., *Month. Labor Rev.*, 28: 6, 1242–1275 (June), 1929.

L. G.

Radium Poisoning—The Bureau of Labor Statistics has just completed a study of the effects on the health of workers of the use of radioactive substances, especially in the painting of watch dials. Inspections were made in 31 establishments in which some 253 workers were directly subjected to possible exposure to radioactive substances. A total of 23 fatalities and 19 living cases were found as a result of this study. The largest number of cases was among watch dial painters, in all totalling 33. The period of service ranged from 14½ months to over 12 years. Apparently all of these workers were in the habit of pointing their brushes between their lips until this custom was prohibited in 1925.

It is recommended that special precautionary measures be adopted to protect the workers in this country against the insidious effects of radioactive substances. A rigid physical examination should be made of all prospective workers to insure their fitness for such occupation, and after employment thorough physical examination, including blood studies and radioactive tests, should be performed every 2 months. Continuous employment should be limited to 2 years.

The remainder of the recommendations refer to the condition and maintenance of the workroom, the storage of radioactive materials, and the handling of radioactive material by the worker. The case histories of 42 cases of radium poisoning are reported in some detail.—*Month. Labor Rev.*, 28: 6, 1200–1241 (June), 1929.

L. G.

Dry Ice—A New Industrial Hazard—The *Monitor* of April, 1929, calls attention to the fact that solid carbon dioxide, known as dry ice, has been the cause of 5 claims for injuries filed with the Ohio Industrial Commission. The ice is used to freeze the core or center of golf balls. Apparently, the practice has been to place these cores in contact with the dry ice and then at the proper time to remove them to a winding machine for completion. The removal of the core is accomplished by hand and apparently produces its effect through the local freezing of certain portions of this member.

In each of the 5 cases reported, the nerves of the fingers, hands, and forearms were affected to such an extent that a neuritis was produced. Twitch-

ing of the arms was an early symptom with numbness and an inability to distinguish between heat and cold, and finally in some cases pain and inability to use the hand. Two of the cases were mild with a 10 to 14 days disability. Others were more prolonged. In one plant a device was installed by which the cores were removed from the containers without contact with the hand. This appears to have eliminated the occupational hazard.—*Month. Labor Rev.*, 29: 1, 96 (July), 1929. L. G.

The Dust Hazard in the Abrasive Industry—This paper presents a second study of workers engaged in the artificial abrasives industry, the first study having been completed and published in 1925. Essentially the task undertaken was a review of the subsequent history of 79 men previously studied, and a comparison of the 1924 with the 1928 X-ray findings, and finally a report of the X-ray findings of the other group of workers who have been exposed to abrasive dust inhalation for 10 years or longer. It is concluded that the inhalation of artificial abrasive dust composed of aluminum oxide or silicon carbide will not produce disabling silicosis in the working period studied. The X-ray pictures failed to reveal any cases of third stage silicosis. The author feels that it is possible for men with arrested tuberculosis processes to work in artificial abrasive industry for a considerable period of time without relighting the processes.—W. Irving Clark, M.D., *J. Indust. Hyg.*, 11: 3, 92 (Mar.), 1929. L. G.

The Cost of Free Advice. Tuberculosis in an Industrial Group—As a result of this study, the annual tuberculosis admission rate among railroad employees was found to be 1 case per 800 persons. The cost to the hospital association for the treatment of far advanced cases was found to average $4,600; for a moderately advanced case, about $1,000; and for the minimal, about $500. It is pointed out that the underlying cause of delay in diagnosis appears to be a tendency on the part of the laymen and doctors alike to ignore the commonplace knowledge of the prevalence of tuberculosis and its earlier symptoms. The importance of being tuberculosis-minded is emphasized, and it is pointed out that free medical service without special attention to the prevention and detection of tuberculosis would not serve to control the disease in this industrial group.—E. W. Phillips, M.D., *J. Indust. Hyg.*, 11: 4, 107 (Apr.), 1929. L. G.

Chrome Poisoning—Attention is called to a recent summary of the available information concerning chrome poisoning which was compiled by the National Safety Council. This report calls attention to the use of chromates in the manufacture and preparation of chromium and chrome colors; color photography; match manufacture; the tar color industry; manufacture of wet batteries; bleaches of fats, waxes and ointments; textile printing; chromium plating; the staining of wood and chromium tanning. According to this report the occurrence of systemic poisoning is doubtful and bronchitis is but occasionally seen.

The more usual symptomatology is referable to the conjunctiva, skin irritation and ulcers on the hands and nasal mucous membrane. It is suggested that washing with a 5 per cent solution of sodium bisulphite is beneficial in that it renders the chromic acid radical inert, and zinc or borax ointment is recommended as a dressing for ulcers. As a wet dressing a lotion of equal parts of calamine and boric acid is suggested.

Preventive measures include the enclosing of machines for the grinding of raw materials, the use of local exhaust ventilation, the use of efficient respira-

tors and impermeable rubber gloves. The anointment of face, hands and arms with a mixture of petrolatum, 3 parts, and lanolin, 1 part, is suggested as a means of preventing skin eruptions.—*Month. Labor Rev.*, 28: 5, 1036–1037 (May), 1929. L. G.

The Noise Evil—The Berlin Chamber of Commerce has adopted 13 resolutions pertaining to the nuisance and danger of noise. These are translated and printed in full in the *J. A. M. A.*, 93, 5: 397–398 (Aug. 3), 1929.

Occupational Diseases: Definition, Cause, Prevalence, and Prevention—This paper was presented before the New England Health Institute at Hartford, Conn., April 23, 1929. It is a very interesting and inclusive contribution and defines occupational disease and shows how specific occupational diseases are the result of existing health hazards. That there are national peculiarities in occupational disease is at once evident when one realizes the national variations in occupation. It is pointed out that in 1924 there were 9 state departments of labor and 21 state health departments receiving, or supposed to receive, reports of occupational diseases, and a discussion is presented showing the functioning of these regulations in many states and territories.

Dr. Hayhurst has laid down 3 principles or provisions emphasizing that the cost of production should include the cost of health conservation in the presence of health hazards; knowledge regarding health hazards and the provision of safe and proper work places is a prerequisite of every employer; and finally the health of the individual is an affair of the state, since in dependency the burden naturally falls on the state. The provisions of the health department should include an occupational disease reporting law or regulation and an office or division of occupational diseases for investigative and research purposes.—Emery R. Hayhurst, M.D., Ph.D., *Month. Labor Rev., 29: 1, 29–51* (July), 1929. L. G.

The Present Status of Benzene (Benzol) Poisoning—The present-day standards for diagnosing benzol poisoning are classified in one state under symptoms of local irritation, of anemia, and of nervous symptoms, while the diagnostic criterions rest upon (1) exposure to benzene at work, which (2) together with any one or more of the symptoms outlined, should warrant a tentative diagnosis, while (3) the finding in addition of a red blood count of less than 4,000,000, or a white count of less than 5,000 in addition should warrant a positive diagnosis of benzene poisoning. However, true benzene poisoning may exist without any leukopenia, and, in fact, in the presence of a leukocytosis. The various circumstances in which normal persons may show some of the blood findings of benzene poisoning, particularly leukopenia, are next discussed. Again other simulating disease conditions must be considered. The infectious leukopenia of Schultz, or agranulocytosis, may occur in the streptococci and pyocyanic infections, with accompanying hemorrhage and inflammation of the gums.

The question of benzene as a toxic entity is somewhat controversial, since there are no published reports on the action of extraordinarily pure benzene. The commoner contaminants are hydrogen sulphide, toluene, and bisulphide of carbon (50% often), according to Herrington.

Lewin, Lehmann and Schwenke have all reported that purified benzene is less toxic than crude varieties. There is, however, no intent to deny or question the actuality of benzene toxicity. Yet a group of 40 japanners, who daily spent from 6 to 8 hours coating cow

hides with enamels containing from 25 to 60 per cent benzene, in a room without artificial ventilation, for a period of more than 10 years, and without regular medical control, have not developed one case of benzene poisoning, other than dermatitis. No claim has ever been made for compensation and medical service, or for loss of time. Such a situation invites a further study of the subject.

Despite Hamilton's contention in 1928, of the lessening menace of benzol poisoning in American industry due to an alleged marked decrease in its use in the past 6 years, McCord points out such is not borne out by statistics on the production of benzene for the period mentioned, and he exhibits a table taken from the U. S. Tariff Commission which shows that, whereas slightly over 60 million gallons were consumed in the United States in 1922, the amount reached 99½ million gallons in 1925, and was over 86 million gallons in 1927.

Need of further work with reference to benzene toxicity is therefore indicated, and the author suggests five different lines of investigation.—Carey P. McCord, *J. A. M. A.*, 93, 4: 280–283 (July 27), 1929.

Lead Dust Hazard—Dr. R. E. Lane (Manchester) read a paper on this subject before the Section on Occupational Diseases of the British Medical Association, in which he emphasized the respiratory tract as by far the most important portal of entry for lead. Normal, healthy people both excreted lead in the urine in measurable quantities and showed minor degrees of basophilia. In research he had carried out he had found a definite relationship between the lead in the atmosphere, the lead excreted in the urine, and the basophilia content: the basophilia could be used in estimating the hazard. "He supported the findings of Sellars that all lead workers have a normal punctate basophilia, and that its mere presence cannot be taken as a proof of lead poisoning." It was, however, a delicate index of the degree of absorption, and as such of great value in anticipating trouble.—*Lancet*, 5528: 283 (Aug. 10), 1929.

The Present Position of Silicosis in Britain—This subject was discussed by the Section on Occupational Diseases of the British Medical Association at its Manchester meeting. Dr. E. L. Middleton, H. M. Medical Inspector of Factories, pointed out that in the pathology of silicosis the particles of silica were phagocyted and the lymphatic channels contained deposits of these cells, which produced a reaction in the surrounding tissues, so that fibrous tissue formed which underwent contraction resulting in distortion, with loss of function of the remaining lung tissue. Sections of the lung showed nodules formed in a whorled arrangement of fibrous tissue, and often particles (if 5 mu in diameter) could be demonstrated by polarized light. When free from other dusts of an irritating kind, silica was inhaled by workers without suspicion that they were exposed to dangerous dust. Dyspnea was usually the first symptom, and might follow exposure at any time of 2 to 40 years. In diagnosis, the employment history should be exhaustively studied, while a careful clinical examination, and a radiographical examination by an expert are essential. Prognosis depended upon: (1) the amount of dust inhaled; (2) the period of time over which this acted; and (3) the occurrence of infective processes, tuberculous or non-tuberculous. If taken in an early stage it seemed that the disease could be arrested.

The industries in which silicosis occurred were the *Refractories Industry* manufacturing ganister and silica bricks, where a specialist medical board now carries out medical examination of all

of the 2,000 to 3,000 persons employed. In the *Sandstone Industry* where silica is most widespread, the diminishing incidence of silicosis is considered due to the application of water and mechanical methods of dust suppression. The *Granite Industry* showed complicated pictures because of the varying proportions of quartz, felspar and mica present in the rock. The *Slate Industry,* as the result of an inquiry, showed some evidences of fibrosis of the lungs, but the occurrence of actual disability within the ordinary working lifetime of workers was not clearly shown. In the *Grinding of Metals* where silicosis with tuberculosis was at one time extremely prevalent, the replacement of sandstone wheels with other types of abrasive wheels, such as carborundum, had greatly modified the affliction. *Sand-blasting* of metals and glass was a matter for serious consideration, and one to determine whether a substitute such as iron or steel grit could not be used. In *Pottery Manufacture,* " potter's asthma " was probably due to flint dust, but the evolution of dust is now controlled by the use of mechanical means. *Tin Mining* in Cornwall had a high mortality rate from tuberculosis, and it was shown that this was associated with silicosis. Now the drilling is done through hollow steel with a water feed. Silicosis also occurred in *Coal Miners* employed on hard headings. It seems that once enough silica had been inhaled to produce the nucleus of fibrosis, the following inhalation of coal dust increased the fibrosis and produced disability. Dr. Middleton pointed out that " there was no criterion of air dustiness which could safely be regarded as indicating freedom from risk of producing the disease."

Dr. P. Heffernan, Tuberculosis Officer, Derbyshire, in a paper on the biophysics of silica and the etiology of silicosis, considered the action of silica as physicochemical in nature, and that alkalis favored the formation of silica hydrosol which increased the development of silicosis, while substances such as carbon, coal dust or clay which retarded the formation of silica hydrosol, retarded silicosis. Silica was a normal constituent of plant and animal cells and had a place in therapeutics comparable to that of lime. Dr. Watkins Pitchford (South Africa) uttered a warning about wet operation, since siliceous mud was potentially siliceous dust.—*Lancet,* 5528: 282–283 (Aug. 10), 1929.

Occupational Diseases and Social Legislation—Social insurance against occupational diseases was first adopted in Germany in May, 1925. As the act brought under insurance only a small proportion, a new act was adopted February 11, 1929, which increases the number of listed occupational diseases from 11 to 22. The newer alterations concern cutaneous disorders, disorders of the muscles, bones and joints, from work with compressed air; deafness from excessive noise in metal working; silicosis (pneumonoconiosis) in sandstone quarries, etc., including coincident pulmonary tuberculosis; typical disorders of sailors (tropical diseases, typhus, scurvy); and infections among the personnel of hospitals, etc. " Accident insurance shall apply to occupational diseases irrespective of whether the disease is caused by an accident or by an injurious action that cannot be classified as an accident." All physicians are compelled to report every case of occupational disease, even though only a suspicion exists. If the fear is justified that an occupational disease will develop, a transitional benefit shall be paid which shall not exceed half of the full benefit and for so long as the worker refrains from working in the menacing industry. Sometimes disability benefit shall be paid in addition to the transitional benefit.—Berlin Letter, *J. A. M. A.,* 93, 6: 473 (Aug. 10), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Effect of Excessive Doses of Irradiated Ergosterol on the Calcium and Phosphorus Content of the Blood—Reference is made to the work of Hess, Weinstock and Rivkin (*Proc. Soc. Exper. Biol. & Med.*, 26, 199) in which it is reported that in young rats on a diet high in phosphorus and very low in calcium, serum calcium was raised to normal by the daily administration of 1 mg. of irradiated ergosterol. In the work here reported, adult animals were used and the calcium intake was not restricted. Rabbits were the experiment animals on unlimited diet of oats and cabbage leaves. One group received a daily dose of 0.5 c.c. of arachis oil, the second, 0.5 c.c. arachis oil with 10 mg. non-irradiated ergosterol, and the third, 0.5 c.c. arachis oil with 10 mg. irradiated ergosterol (irradiation in alcohol). Calcium and phosphorus determinations made periodically showed no change until 25 days after the beginning of the experimental dose. The following day, in the case of two rabbits increased amount of phosphorus was noted but the calcium was normal. Two weeks later the phosphorus was 50 per cent above normal, with a slight increase in calcium but no change in the controls. Post-mortem examination showed the calcium in the kidney and the urine was saturated with calcium salts. Since deficiency of vitamin D results in low blood phosphorus or calcium, or both, it was concluded that excess of this vitamin may result, depending on the diet, in high phosphorus or calcium, or both. In an experiment performed on young rats in which the irradiated ergosterol (0.1 per cent of the diet) was given for 14 days, loss of weight resulted and high inorganic phosphorus and increased serum calcium, respectively 50 per cent and 25 per cent above normal. The increase in inorganic phosphorus which appears to precede the hypercalcemia is being studied.—Leslie Julius Harris and Corbett Page Stewart, *Biochem. J.*, 23: 206, 1929.

Bacteriological Studies of Sulphide Spoilage of Canned Vegetables—Outbreaks of sulphide spoilage occur sporadically in sweet corn and pea canneries. Such outbreaks generally involve a substantial part of the season's pack, and in several instances the entire season's pack has been so heavily contaminated that salvage was impracticable. In this bulletin a report is made regarding the cause of the condition and the identification of the microörganism responsible. It is reported that sulphide spoilage, characterized by an odor of hydrogen sulphide and some darkening of the product but no swelling of the container, is caused by the growth of an anaerobic spore-forming thermophile to which has been given the name, *Clostridium nigrificans*. The organism is a thermophile growing at an optimum temperature of 55° C. *Clostridium nigrificans* has proved to be one of the most heat resistant bacteria. Exposed to a temperature of 100° C. at pH 7.0 the spores remain viable for as long as 8 hours. Processing at 118° C. (245° F.) for 70 minutes has not proved effective in destroying the spore of *Cl. nigrificans* in No. 2 cans of sweet corn. The organism was not pathogenic

when ingested by man, guinea pig, mouse, rat, or rabbit. It is desirable in the control of *Cl. nigrificans* to eliminate the foci of infection in the cannery and prevent the presence of spores in the product. The organism occurs in the soil, in manure and on sugar, and probably finds its way into the cannery in these materials, where it may set up a focus of infection. There is little possibility of the organism causing spoilage in vegetables other than peas and sweet corn.—C. H. Werkman, Iowa Agri. Exper. Station Research *Bull. No. 117*, May, 1929.

Hypervitaminosis and Vitamin Balance—Part II. The Specificity of Vitamin D in Irradiated Ergosterol Poisoning—The work here recorded was undertaken to demonstrate whether the effects of hypervitaminosis evidenced in young rats were due to the vitamin *per se* or to accompanying toxic substances as has been alleged. The British drug firm which supplied the specimen stated that their observation was to the effect that ergosterol irradiated in alcohol showed toxic effects but that ergosterol irradiated in oil without the use of alcohol did not show the usual hypervitaminosis. Three separate experiments were undertaken, one in which over-irradiated ergosterol was used; one in which oil irradiated was compared to alcohol irradiated ergosterol; and the third in which the ergosterol was irradiated without the use of a solvent. In the first experiment, over-irradiated ergosterol was prepared from a specimen of the irradiated product which had proved toxic.

Three groups of rats were fed the same basal ration supplemented with non-irradiated ergosterol, with irradiated ergosterol, and with over-irradiated ergosterol. In the latter two the concentration was the same, 0.1 per cent of the diet. Animals on irradiated ergosterol lost weight and appetite, showed diminished heart beat, and died in 20 to 34 days with post-mortem evidence of deposits of calcium salts in various organs. Those on over-irradiated ergosterol were comparable with those on the non-irradiated with no abnormalities evidenced on autopsy.

In a second experiment rats were divided into 3 groups, one on a diet containing 0.025 per cent alcohol irradiated ergosterol, one group with the same concentration of ergosterol irradiated in oil, and the third group, the control, without ergosterol. The results showed no difference in degree of toxicity between the two types of irradiated ergosterol, death occurring at the same time in both groups.

Post-mortem examination showed diminution of spleen, atrophy of thymus, and calcium deposits in kidneys, aorta and heart. In the third experiment ergosterol was employed which had been irradiated in a thin film in an atmosphere of nitrogen and was incorporated in the diet at 0.1 per cent level. While the animals grew almost normally, after 28 days the autopsies revealed extensive deposits of calcium in the internal organs as in the other experiments.

The authors believe that if the toxic effects were due to impurities in ergosterol, these would persist in the case of the over-irradiated product, at least, that it would be an unusual coincidence otherwise. The pathological symptoms of hypervitaminosis are discussed, the important features of which are remarkably high blood-phosphate, diminished pH of the feces, diminished heart rate, and atrophy of the thymus. There is both a low and high threshold value for vitamin D, below which typical deficiency symptoms appear and above which increased blood-phosphorus and calcification with or without increase in blood-calcium.—Leslie Julius Harris and Thomas Moore, *Biochem. J.*, 23: 261, 1929.

Studies on the Nutritive Value of Milk. II. The Supplementary Value of Inorganic Iron and Copper—A previous paper by this author (*A. J. P. H.*, XIX, 5 (May), 1929) records the production of anemia in young rats by feeding exclusive whole milk diets. A continuation of the milk feeding experiment made necessary a supplement which would prevent this anemia. Iron was the first supplement tried, a solution of ferrous sulphate being made so that 1 c.c. contained 0.4 mg. iron. The growth results were unsatisfactory as were those when ferric citrate was used. The condition of the rats resembled xerophthalmia. A colloidal solution of ferric oxide was prepared and fed at the same level but anemia developed, although the rats were in better condition than those on the iron salts. Copper was used and 0.16 mg. of the metal as copper sulphate was added to the milk of one group and 0.2 mg. iron as colloidal ferric oxide was given to the other group. The addition of iron alone resulted in good growth but did not prevent decreased hemoglobin. When the copper supplement was added, there was a response in weight and increased hemoglobin. Copper alone resulted in growth and a rise in hemoglobin content to normal. This is not attributed to iron impurities in the copper but since milk supplies only 0.1 to 0.2 mg. it is concluded that either iron is required for hemoglobin formation or that present in the milk is made more available by the copper. The work apparently indicates a deficiency of milk in copper as well as in iron content. No offspring has ever been produced from mixed lots of rats on this diet, indicating the possibility of an adverse effect of copper and iron supplements on reproduction.

The production of nutritional anemia offers an opportunity to study the nutritive effect of exclusive whole milk diets.—W. E. Krause, *J. Dairy Sci.*, 12: 242 (May), 1929.

Iron in Nutrition. VIII. The Ineffectiveness of High Doses of Iron in Curing Anemia in the Rat—Reference is made to a report (Abstract, *A. J. P. H.*, 18: 1058 (Aug.), 1928) that inorganic iron at a daily level of 0.5 mg. was ineffective in curing nutritional anemia in rats. It was observed, but not reported, that 2 mg. of iron would stimulate hemoglobin regeneration. This observation raised the question as to the purity of the iron, and an experiment was undertaken in which specially purified iron was used. Purified ferric chloride was fed to anemic rats at 2, 5 and 10 mg. levels daily, 6 days a week. Similar amounts of iron not especially purified were fed to other groups.

The growth curves and tables show that the unpurified ferric chloride increased the hemoglobin level over an experimental period of 14 weeks, while those receiving specially purified iron salts made no progress in hemoglobin regeneration and did not increase in body weight.

There were exceptions in 2 individuals on the pure iron which did show some regeneration and this is attributed to the possibility of excess reserves of copper. The authors conclude that this is the explanation of the conflicting reports in the literature as to the effect of iron salts on hemoglobin formation since the iron wire before special purification was a high grade product used for standardization.—J. Waddell, H. Steenbock, and E. B. Hart, *J. Biol. Chem.*, 83: 243 (July), 1929.

IX. Further Proof That the Anemia Produced on Diets of Whole Milk and Iron Is Due to a Deficiency of Copper—As the result of previous experiments on the influence of copper in hemoglobin formation, the question was undecided as to whether copper is the only element which can supplement iron in this phenomenon.

A commercial liver preparation (Eli Lilly and Company) was ashed and the copper separated from it by electrolysis. This electrolytic copper with the residue was fed to anemic rats at a level representing 0.3 gm. of the original preparation (0.05 mg. Cu). In addition, rats were fed 0.05 mg. Cu as copper sulfate. Hemoglobin level and body weight increased in the groups fed the electrolyzed copper and the copper sulfate, but the residue after electrolysis was not effective.

Another experiment was performed in which the liver preparation, a hydrogen sulfide fraction of the acid extract of the ash of this preparation, and copper sulfate were compared. The quantities taken provided for copper ranging in amounts from 0.001 to 0.05 mg. of Cu. In other experiments various liver preparations were fed introducing similar amounts of copper.

Not all of the results of these experiments involving 15 litters of rats are published, but the results are stated to be uniform for all of the additions of copper. Hydrogen sulfide fractions of the ash extracts were as potent as the preparations and equivalent to the copper introduced as sulfate.

The authors conclude that this is convincing proof that the diet deficiency is inorganic and that it is copper only.—J. Waddell, H. Steenbock, C. A. Elvehjem, and E. B. Hart, *J. Biol. Chem.*, 83: 251 (July), 1929.

The Effect of Diet on the Copper Content of Milk—As an extension of the work (Abstract, *A. J. P. H.*, 18: 1059 (Aug.), 1928) on the influence of copper in prevention of anemia in rats on a milk diet, the amount of copper actually present in the milk of cows and of goats has been studied, as well as the effect on milk in administering additional copper. Weekly samples of milk for a period of 4 weeks were taken from Holstein cows on standard ration. The daily intake of copper in food was found to be approximately 60 mg. At the end of 4 weeks, 5 times this amount (1.2 gm. of $CuSO_4 . 5H_2O$) was added to each cow's ration.

Samples of milk were also collected from various sections of the United States and analyzed for copper. The materials were ignited in porcelain dishes which had been previously extracted so as to be copper-free. The copper content of the milk from cows on the basic ration was found to average 0.15 mg. per liter, lower than most of the figures found in the literature. The milk after the supplement of copper salts was found to contain practically no more copper, indicating the copper content of the milk not to be increased by feeding additional copper in the amounts recorded in this experiment.

Milk from various sections of the United States varied from 0.123 mg. per liter (North Carolina) to 0.184 mg. per liter (Texas), indicating the copper content practically uniform under various conditions.

The copper content of goat milk was about the same as that of cows and the addition of 50 to 25 mg. of copper daily to the ration did not change the copper content of the milk. The authors point out that the amount of copper in milk samples confirms biological findings and conclude that the different rates of hemoglobin reproduction reported by investigators are due not to variations of the copper content of the milk but to contamination after production or to unknown sources of copper.—C. A. Elvehjem, H. Steenbock, and E. B. Hart, *J. Biol. Chem.*, 83: 27 (July), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

A New Theory of the Cause of Dental Caries—"The etiology of dental caries as taught today was first formulated by W. D. Miller. He showed that the bacterial fermentation of carbohydrate food particles remaining upon the teeth forms lactic acid, which attacks their mineral constituents, while the organic basis substance is destroyed by another type of bacteria. Thus a cavity is formed in the tooth.

"A further and important contribution was made by Bunting, who found that a certain type of bacteria, *Bacillus acidophilus,* is always present during the decay of the teeth.

"That this presentation of the cause of dental caries does not completely explain the varying occurrence of this disease is proved by the number of investigations that have been undertaken since the time of Miller. These investigators have felt that Miller's theory does not explain the disease in all its phases, as the following exceptions can be noted:

"1. Teeth do not *always* decay in the presence of food debris.

"2. There appears to be an increase in susceptibility to dental decay during pregnancy and systemic illness.

"3. Pulpless teeth often seem to be more prone to decay than vital ones.

"4. The occurrence of approximal decay, affecting only one of the two adjacent teeth.

"5. That mottled enamel, which appears to be poorly calcified, is not more susceptible to decay than normal enamel.

"We note, therefore, that the present theory of decay does not explain all its phases.

. . .

"The resistance of the teeth to decay may be explained by the presence of the dental lymph, which is normal only so long as that individual is in a healthy condition. This is as yet purely a theory, which, however, is based upon the following data:

"1. A system of channels has been proved to be present in both the dentin and the enamel.

"2. These channels have been proved by laboratory and by animal experiment to be permeable from the pulp chamber up to the surface of the tooth.

"3. Blood plasma is known to contain free mineral salts, which neutralize lactic acid in other parts of the body and vary in quantity, depending upon the health of the individual.

"It is therefore plausible that normal dental lymph passes through the dentin and enamel of the teeth of man as well as those of the dog, and that it neutralizes whatever acid it encounters, thus inhibiting dental caries. A great deal of work, however, remains to be done to check up various phases of this theory. Nevertheless, even in its present stage of incompleteness, this theory gives for the first time a logical explanation of all clinical exceptions noted at the beginning of this paper.

"My view of the factors governing the relation between dental decay and systemic health is stated concisely as follows:

"I. Exciting cause of dental caries. Carbohydrate food decomposes in the presence of bacteria, forming lactic acid (Miller).

"II. Predisposing cause. Quantitative and qualitative changes of the dental lymph, diffusing to all free surfaces of the crowns of the teeth: (a) Dental lymph is derived from the blood plasma: (b) if the mineral content of the dental lymph is sufficiently high, it will neutralize the lactic acid on the sur-

face of the tooth and no decay can result; (c) if the mineral content of the blood plasma is decreased through systemic illnesses, it causes a corresponding reduction in the character of the dental lymph and therefore an insufficient neutralization of the lactic acid, resulting in dental caries; (d) variations of the mineral content of the dental lymph are dependent upon the character of the blood plasma, which are in turn affected by the general health of the individual, thus establishing a close relationship between the enamel and dentin of the teeth and the body as a whole."—Charles F. Bodecker, D.D.S., F.A.C.D., *Dental Cosmos,* June, 1929.

A Plea for Simplicity—In this timely article, Dr. Griffith urges greater simplicity in the teaching of pediatrics. He finds several sources to blame for the lack of direct teaching of the principles which will be of use to the young practitioner who must work his way up through general practice. The graded course, excess of laboratory work, and the methods used in the teaching of pediatrics itself, all come in for their share of blame. " The question then is, what have we taught him (the medical student) upon which he can now fall back? How much has been taught by us as to the actual handling of the sick child, and, even more important, of the mother of the sick child? "

Dr. Griffith criticises his own teaching no less severely than that of others. He suggests that simplicity in teaching undergraduates might well extend to the teaching of graduates through medical literature, and remarks: " The inclosure in them of unimportant or confusing things is often true of our textbooks which frequently contain much that could well be omitted."

He also remarks that many of the articles published today " show only a disposition on the part of the writer to get into print ahead of someone else."

The *Standard Dictionary* definition of " pediatrics " as " the department of medical science that relates to hygienic care of children and treatment of the diseases peculiar to childhood " is accepted.—J. P. Crozer Griffith, M.D., *Arch. Pediat.,* May, 1929.

Ovarian Irradiation and Health of Subsequent Child—" Murphy delivers his second communication dealing with the health of children born following maternal pelvic radium or roentgen irradiation. An attempt has been made to determine the nature, seriousness and frequency of any disturbances of health or defects in development among these children, and to ascertain, if possible, whether the maternal irradiation was entirely or only partly responsible for such faulty structure or disturbances of function as may be found among them. From the study of the literature and from an estimation based on the replies to a questionnaire, it seems apparent that relatively few children have been born to women who were subjected to pelvic irradiation. Fifty-three women are reported on who received postconception pelvic radium or roentgen irradiation. Abortion occurred in 23 instances (43.4 per cent).

" Of the 30 children born at term, 12 (40 per cent) presented some more or less serious disturbances of health or development. These defects, in many instances, were quite serious and tended to conform somewhat to a type. Two hundred and thirty pregnancies are reported on, occurring in women who received preconception pelvic irradiation. Abortion occurred in 50 (21.7 per cent) instances. Of the 180 children born at term, 27 (15 per cent) presented some disturbance of health or defect in development. These defects were much less severe than those occurring in the preceding group and did not conform in any way to a type. There is as yet no definite indication that ovarian irradia-

tion, prior to fertilization, has any detrimental influence on the health or development of any subsequent children." —D. P. Murphy, *Surg., Gynec., Obst.*, June, 1929 (abstracted by *J. A. M. A.*, July 20, 1929).

Birth and Death Rates for 1928—The U. S. Public Health Service in its *Public Health Reports* for August 2 summarizes the provisional birth, death and infant mortality rates for 1928 as given out by the U. S. Department of Commerce. These are for the birth registration area exclusive of Massachusetts and Utah.

The birth rate dropped one point during 1928 (19.7 as compared with 20.7 for 1927). The highest rate was in North Carolina (27.5 per 1,000 population). The death rate for 1928 for the above group of states was 12.3 as compared with 11.4 for 1927.

The infant mortality, too, has gone up several points, showing a rate of 68 for 1928 as contrasted with 64.6 for 1927. Oregon showed the lowest rate, namely, 46.9.

Jolts like this, coming as they do about every other year or so, ought to be good for public health workers, teaching us humility. But it does not work out that way at all. Credit is always claimed for all reductions, but a discreet silence is maintained regarding increases. What a relief it would be if some time propaganda were to be replaced by statements of sober facts and a little more effort put into teaching the public what the facts really mean.

School Health Supervision in Detroit—For the past few years the city of Detroit has been carrying on what is generally recognized as a most interesting experiment in school health supervision. The following summary of present practice in that city is contributed by Dr. Don W. Gudakunst:

The so-called Teacher Health Inspection System has been in operation in the Detroit Schools since 1921.

It has met with the unqualified approval of the Board of Education, the school principals and teachers. The School Health Service, which is under the administration of the Board of Health, has found this plan to be of the greatest help.

All school teachers in the City of Detroit are given a course of lectures and demonstrations as to the means of detecting any physical defects, or any indications of defects of vision, hearing, tonsils, teeth, skin and posture. Each child receives an inspection from his teacher early in the school year. Those children whom the teachers find to have some indication of defects are referred to the school physician for a more careful examination.

By this means those children most in need of medical examination are assured of such care. In a school system as large as Detroit it would be impractical to give an examination to each child every year.

Analysis of the markings of the teacher and of the physician shows very high corre'ation. However, no notification of the defect is sent to the parent based solely upon the teacher's inspection. Her work is used merely as a screen to pick out those children most urgently in need of medical care. This system has proved so popular in Detroit that it has spread on a purely voluntary basis from a few schools in 1921, to all of the public schools for the past few years, and now has been taken up by many of the private and parochial schools.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Looking Ahead—The student nurse of today is the public health nurse of tomorrow, and the public health nursing group has a very direct responsibility for following and aiding the work of the League of Nursing Education. Much good has come to the nursing profession through legislation since the days of Florence Nightingale, but "there's many a slip" in laws already passed, while excellent bills, awaiting legislative action, meet with little or no success. The article by Miss Burgess embodies the ideals of the National League of Nursing Education, and enumerates three projects, necessary for further advancement of nursing education, which need legislative action. While this subject seems to be fundamentally a League problem, it pertains to public health nurses also because, if we really function to any great degree in the community, matters of legislation will affect us materially.

The purpose of the League is the advancement of the education of the nurse. First, it is interested in the preparation of women in the "knowledges, skills, technics and qualities needed by everyone who is to give good nursing care, and second, in the further preparation required by those who would enter special forms of nursing service." Briefly then, its objects are service, higher education, and research. It attempts to determine and make possible the best education of the workers, and to promote better nursing service of all types.

The problems of today differ tremendously from those of the past. Now complicated treatments, diets and preventive measures require special skill. The committee grading schools of nursing will endeavor to show in what degree the skill is being provided, and bring to light one aspect of the nursing situation with which the League is greatly concerned; namely, the laws regulating the practice of nursing.

One of the earliest steps taken by the League was the establishment of a uniform curriculum—including qualifications, examinations, and percentage of excellence required, so that a universal standard might be maintained. Like everything else today, standards must be progressive to meet the ever changing needs, and legislation can keep them progressive.

In a few states, the law requires 8 grades of elementary school before a girl may enter a school of nursing; in others, she may enter after 1, 2, or 4 years of high school; while in 4 states the matter of education is left to the decision of the Board of Nurse Examiners.

The board sets up standards in the majority of states; inspects the schools; determines what shall be an accredited school; sets the examinations; and rates the candidates for the license to practice. The board may be composed entirely of nurses; the majority of its members may be nurses and the others physicians; the majority may be physicians and the others nurses; in 1 state, the board is composed wholly of physicians; and in another it is made up of nurses and one lay member. The law prescribes the professional qualifications

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* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

of the nurses on these boards, which range from graduation from a nursing school, to 5 years of educational work with nurses. This legal provision is meager, and a study of the individual qualifications of each member would be revealing.

Although we should be vitally interested in the amount and character of the clinical material provided for students, what is asked for in the laws is indicated by the bed capacity of hospitals, and the daily average of patients accepted.

Affiliations for the smallest schools with larger schools are not required by law in certain states. The Red Cross found this to be true when it penetrated the less populated areas, and accredited schools were stimulated to increase their service through affiliation, but this is by no means general.

There is great variation in the laws concerning the length of training which nurses shall have. Some states set 2 years as a minimum; others, 2 years and 4 months; while still others require 3 years in a hospital, thus making it impossible to add public health experience or give credit for college work. Where only minimum educational experience can be given, a minimum amount of time should be required.

There should also be a law requiring all those who nurse for hire to be licensed.

A national examining board, such as the American Medical Association evolved in 1915, would be helpful in solving the reciprocity question and in clarifying the standards of nursing education, and it would be the first step toward reciprocal relations with other countries.

To sum up, there are three important objectives to attain, which will require the combined help of the three national nursing associations; namely, the elevation of standards through the states, compulsory licensing, and provision for a national examining board.—Elizabeth C. Burgess, R.N., Advancement of Education through Legislation, *Am. J. Nurs.*, 29, 7: 765 (July), 1929.

M. A.

The Public Health Nurse's Lost Opportunity—Everyone realizes that the public health nurse in a community usually has easy entrée into the homes of her patients, and this is half the battle in doing preventive health work; but if when she gets into the home she is not observant and does not take opportunities to teach the family or individual members of it better ways of safeguarding their health, half of her effectiveness has been lost.

For instance, a new, well trained nurse interested in how the public health nurses in a community carried on their work accompanied several of them on their daily rounds. The first one was intelligent, a high school graduate, and had been in her position for several years. She had been asked by a school teacher to look into the condition of two of her pupils. One, a girl about 11, had poor vision, and her brother, age 8, could not talk plainly, and the teacher felt that he might be of retarded intelligence. The nurse had already made several visits to this family and had managed to get these two children put under a physician's treatment.

On this particular visit the observer noted that there were three other children in the family, including a baby 1 year old, walking with very bowed legs, and showing other indications of malnutrition.

The mother herself was very frail and looked haggard and worn. She casually mentioned that she had had malaria shortly before the baby was born, and that her mother had died of "consumption."

The nurse, despite the fact that she should have considered the family as a unit, was intent upon only one thing—

to get the necessary blanks filled out which would insure treatment for the two children whom the teacher had referred to her. Not a word was said about the physical condition of the mother, or whether she had recently or ever had a good physical examination. No question was asked about the baby's food, or the amount of sunshine or fresh air he got. The child welfare station in the community was not mentioned. Apparently in all her visits the nurse had never thought of mentioning these matters. The mother was grateful for what the nurse was doing for her two children; she was friendly and receptive —all the more reason the nurse should have seized her opportunity to do something constructive for her and her baby.

This is only one illustration out of many. In looking into the qualifications of this nurse it was found that she had had no theoretical training in public health nursing, nor had she had more than 6 weeks' experience in public health nursing under supervision while in training. For several years she had been working without supervision.

The *Appraisal Forms* of the American Public Health Association for both rural and city health work have set up standards for the number of visits a public health nurse should make in behalf of infants, preschool children, school children, tuberculous cases, communicable disease cases, and others; but what assurance is there that, even if the organization puts forth the effort to get the required number of nurses to make all these visits, the quality of their work will be such as to justify the effort?

Nowadays at least a year on the staff of a good public health nursing association or health department, under a well trained supervising nurse, is necessary. A young nurse just beginning public health nursing work is pitifully lacking in observation of the needs, or opportunities to teach health lessons in the homes of her patients. That ability must come through gradual training, through a supervisor who accompanies her on her visits and, in a constructive way, brings out points in the visit that the nurse would never think of, and through staff conferences and demonstrations both in the office and in the home. To get a broader perspective of public health in all its phases, at least 4 months of theory in one of the universities offering an approved course in public health nursing is necessary.

Nor can we be sure that the nurse even under supervision has had the right training unless we look into the experience and training of her supervising nurse, of the director of the teaching center (if there is one), and of the nurse director of the whole staff (if the organization is large). They, too, require both practical and theoretical training to get the full perspective and broad point of view their positions demand. The National Organization for Public Health Nursing can help out here, if anyone is in doubt.

Until all these requirements are met there will be many nurses doing public health nursing in communities who are not real public health nurses, because, while they may be adept at the mechanics of nursing, they lack the vision to see the family behind the patient and the community behind the family, which characterizes the good health teacher; and Mary S. Gardner says that it is principally as a teacher that the public health nurse has justified her existence.

A New Course for Public Health Nurses—At the present time there are in the United States 11 courses for public health nurses which have been graded by the National Organization for Public Health Nursing as meeting certain minimum requirements in regard to technical and practical instruction. These courses are conducted in the following universities or colleges throughout the United States:

University of California, Berkeley, Calif.; Simmons College, Boston, Mass.; University of Michigan, Ann Arbor, Mich.; University of Minnesota, Minneapolis, Minn.; Teachers College, Columbia University, New York, N. Y.; Western Reserve University, Cleveland, O.; University of Oregon, Portland, Ore.; Pennsylvania School of Social and Health Work, Philadelphia, Pa.; George Peabody College for Teachers, Nashville, Tenn.; College of William and Mary, Richmond, Va.; and the University of Washington, Seattle, Wash.

This fall the School of Nursing of Washington University, St. Louis, Mo., will offer a course in public health nursing, with the coöperation of other departments of the university and of the following organizations: Health Department of the City of St. Louis, State Board of Health Rural Teaching Center, St. Louis Visiting Nurse Association, and St. Louis Provident Association.

Negotiations for affiliations with other agencies will proceed as rapidly as possible.

The announcement continues:

The purpose of the course is to prepare qualified nurses for positions in the various fields of public health nursing.

Completion of the prescribed course will entitle the student to a Certificate in Public Health Nursing.

Requirements for Admission

1. Graduation from an accredited high school

2. Graduation from a course in nursing extending over a period of at least 2 years, conducted by a school of nursing connected with a hospital which has a minimum daily average of 30 patients during the candidate's period of training, and which provides experience in pediatrics, obstetrics, and medical and surgical nursing of men and women

3. State registration

(If a nurse meets the above requirements, she will also be eligible for membership in the National Organization for Public Health Nursing.)

4. Satisfactory condition of health as determined by a medical examination made by the University Health Service

Plan of Work

The program will cover one academic year of two semesters, a period of about 9 months. Registration begins September 19, 1929.

The first semester will be given chiefly to classroom work, assigned reading, lectures, and excursions. Courses in educational psychology, social science, public health nursing, mental hygiene, and public health and hygiene, totalling 17 semester hours, will be required.

The second semester's work will consist chiefly of field experience with health and social agencies, including special demonstrations, conferences, home visiting, clinic experience, and excursions. The selection of field work will depend somewhat upon the student's previous experience and her purpose in taking the course.

It is hoped that when the course is graded by the National Organization for Public Health Nursing, it will be put on the list of those approved by that organization.

Hitherto, there has been a large stretch of country between California and Washington and Minnesota and Tennessee without a course of this kind, and it should fill a long felt need.

REFERENCES

Courses in Public Health Nursing for Graduate Nurses—National Organization for Public Health Nursing, New York, N. Y.

Public Health Nursing Course—Washington University School of Nursing, St. Louis, Mo.; Sept., 1929–June, 1930.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

"Too Much, or Too Little"—Thus *Editor and Publisher* characterizes a type of investigation publicity which sometimes tempts health agencies. A few weeks ago health officials reported that 9 of the 90 varieties of lipstick on the market "contained benzol, a chemical with puzzling and often dangerous reactions on human tissue. Face powders contained lead. Hair dyes did their job through the agency of a chemical containing most of the alphabet and heaven knows what else, but certainly poisonous. A few days previously, the seizure of a large quantity of impure and therefore deadly ether was reported from Boston." The editorial states the newspaper's interest in protecting its clientele and in keeping out advertisements of "merchandise branded as harmful by responsible public authority."

"Nine of the 90 lipsticks contain poison—but which 9? Some hair dyes perform with chemicals of baffling title and character—but is the article condemned on the front page the same one extolled in back-page advertising? No publisher knows. No reader knows.

"The inspectors who seized the adulterated ether in Boston mentioned no names. Neither did the New York cosmetic detectives. Amazingly, they protected the swindler and the potential poisoner, but slandered by implication every reputable competitor.

"It may be that the commercial chemists need a thorough going-over in the public interest and a few jail terms for conscienceless exploiters of human trouble. But it is sure that neither the industry nor the public will gain by investigations and seizures with a front page column as net tangible result and freedom to the offenders to continue their twisting in the hope that officialdom comes up for air only 'so often.'"

Do We Know What They Want?—Do we know what girls will read, and what will influence their health habits? These questions are prompted by a strikingly well done pamphlet of 16 pages addressed to girls—"It"—And How! written by Margaret Breen and issued by the Minnesota Public Health Association, 11 W. Summit Ave., St. Paul, Minn. *10 cents.*

In its aim of appealing to the desire to be popular "It" is certainly sound. We should think it would be successful, but if one could get the reactions on some of the more thoughtless young people who most need the advice it contains, it would be worth a lot more than anything health workers may say about it. Try-outs of the pamphlet conducted by someone not concerned with writing or publishing the pamphlet, and skilled in getting at the real attitudes of girls would be valuable.

In the frank use of an appeal to which we older people think girls will respond, in its lively and attractive illustrations, readable type, and good writing, "It" stands out from the mass of popular health publications. Some of the rather extravagant phrases are open to criticism. For example, on page 3, "without 'It' you are lost for you cannot keep up with the rest and you will be ignored," etc. All this, of course, is putting it rather strong.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Everyone concerned with public health education will wish to examine a copy, and probably many will try out a few copies for their own satisfaction. The editor hopes to receive some reports on the results.

This Same Question—Do We Know What's What?—is raised by The Kewpies Health Book, written and illustrated by Rose O'Neill—published by National Tuberculosis Association, 370 7th Ave., New York, N. Y. 5 cents; 100 for $2.00. It was an achievement to secure this 6-page folder from the creator of the Kewpies. Intended especially for use in kindergarten and primary grades. Kewpie fans, young and old, will love it. Mothers and nurse-maids will welcome it. It is something to slip into Christmas packages for children. Will it teach health habits? Who knows? But let's try it out.

National Publicity Groups—Paul Bliss, St. Louis Community Chest, 2221 Locust Street, St. Louis, Mo., is chairman of the Social Work Publicity Council. The executive committee includes: Frank Kiernan, Massachusetts Tuberculosis League; Katherine W. Whipple, New York Tuberculosis and Health Association; Virginia R. Wing, Cleveland Health Council.

Charles C. Stillman, Ohio State University, Columbus, O., is chairman of Educational Publicity Division, National Conference of Social Work. Bernard C. Roloff, Chicago Department of Health, and Virginia R. Wing, Cleveland Health Council, are members of the executive committee.

The next meetings will be in Boston, late spring of 1930.

TIMELY TOPICS

You will find unusually good leads for newspaper interviews and for paragraphs for your house organ in some of the changing customs and topics of general discussion offered during the past season. For example:

"The Hollywood Diet"—see editorial and "If You Want to Lose Weight," in *Better Health,* Dept. of Health, Syracuse, N. Y., Aug., 1929. *Free.*

A lively editorial, "The Eighteen Day Diet," appears in *Hygeia,* Sept., 1929. An abbreviation, "Hygeia Explains Hollywood Diet," is supplied free in *Hygeia Clip Sheet,* Sept., 1929. *Free.*

The problems of mechanical refrigeration are concisely outlined in *Health News,* U. S. Public Health Service, Washington, D. C. Ask for F–31–A. *Free.*

The past summer brought widespread discussion of the follies of men's clothing. Material for future use includes "What Is Rational Clothing?" answered in three mimeographed pages by League of Red Cross Societies, 2, Avenue Velasquez, Paris 8, France; and a radio talk by Dr. G. W. Goler, tells how men came to wear what they do, with a prophecy of better things. In *Health Bureau,* Bureau of Health, Rochester, N. Y., July, 1929. *Free.*

"Some 'Do's' and 'Don't's' on Ivy and Sumac Poisoning," *Clip Sheet,* Dept. of Agriculture, Washington, D. C., June 23, 1929. *Free.* Includes reference to *Farmers' Bulletin* 1166–F "as an aid to identifying the poison ivy plants and directions for treatments."

"Sun Tan Fashions Come from Switzerland, Say Tuberculosis Workers"—*Clip Sheet,* New Jersey Tuberculosis League, 21 Walnut St., Newark, N. J., July, 1929. *Free.* From Dr. Rollier to New Jersey sanatoria sun treatment. Also same *Clip Sheet,* under "The Song of the Skirt" touches on "the scanty clothing of the 1929 flapper" and quotes the old time "Song of the Skirt." (Incidentally beware of talking "flapper" much longer!)

"Modern Sun Worshipers"—Oregon

State Board of Health, July 30, 1929. Savage worship, modern tan and non-medical use of artificial sunlight. *Free.*

In "Beauty (?) Unadorned," *Woman's Journal* (Aug., 1929) says: "Just possibly when a girl finds that her back is not nice and flat she will take corrective exercises and will develop muscles to add to her grace, but we see no sign that that is to be the result." But publicity cleverly directed may bring that result.

REPORTING

What the Chicago Tuberculosis Institute is Doing (360 North Michigan Ave.) is told in 6 large pages of pictures with captions—and no statistics. *Free.*

In contrast, the Division of Social Hygiene, New York State Dept. of Health, in *Five Years of Social Hygiene Activities Presented Graphically,* uses 9 pages of diagrams to show quickly what has been done in education, clinics and laboratory services. *Free.*

A report in miniature is that of the Community Health Assn., Boston, Mass., which received special mention in the 1929 competition conducted by the Social Work Publicity Council. Said the contest committee: "It has a neat, appealing self-enclosed cover. . . . The list of services rendered . . . gives one the impression of conciseness and yet of a broad field of service. The chart of income and expenditure is vivid and the list of what specific gifts of money will do is appealing. The photos are not as good as they should be. The cost for 5,000 was $596." *Free.*

The readable descriptive report, without statistical data, is illustrated by a Review for 1928, Rockefeller Foundation. Size, paper, type, illustrations and text in combination produce an effective publication for semipopular use. *Free.*

Again the Milbank Memorial Fund in its 1928 report illustrates what can be done to present a readable, dignified record of a year's varied health and other social activities. While not "popular" in its appeal, the report is a recognition of the right of the student and the specialist to have reference material submitted in pleasing form. For the most part, the statistical data have been reduced to simple, clear diagrams. Illustrations appear on the same antique paper as the text. Bertrand Brown, in charge of publications, is prepared to demonstrate the comparative inexpensiveness of a well-printed report. The one disappointment is the lack of an index which would add considerably to the ready usefulness of the volume. *Free.* Address 49 Wall St., New York, N. Y.

THE OFFICE

Most of our mimeographed publicity looks dull enough even when it is neatly done. Too much of it is badly done. The best single help towards better and better mimeograph work is "How to Play the Mimeograph," by Dr. H. E. Kleinschmidt of the National Tuberculosis Association. This is an illustrated mimeographed pamphlet, entertaining and practical. Good for the "boss" who does the planning, for "Sally Ann" who cuts the stencil, and "Oscar" who finishes the job. Distributed only by Social Work Publicity Council, 130 East 22d St., New York, N. Y. *Send 4 cents postage.*

If you wish a duplicate set of any list in the form of typewritten cards, or a card record of the addresses made when envelopes are addressed, or a card copy of order slips or address stickers, or a card record of persons receiving notifications or communications—all made without extra typewriting when the original is typewritten—mention the JOURNAL and ask Direct Service Co., 604 Elwood Bldg., Rochester, N. Y., to send samples of sensitized cards.

Three commemorative 2-cent stamps have been issued recently—Sullivan Expedition, Edison, and Anthony Wayne. If not available locally, can be ordered through the Philatelic Agency, Post Office Dept., Washington, D. C.—if wanted to add a bit of distinction to your mail.

CHILDREN AND SCHOOLS

"Blue Ribbon Contests in Rutherford County." *News-Letter,* Commonwealth Fund, 1 East 57th St., New York, N. Y., June, 1927. *Free.* Annual parade of blue ribbon winners; growth of interest in the blue ribbon idea.

"Education in Good Posture," by J. Mace Andress. Introduction to a series of projects, with classroom material. *Hygeia,* July, 1929. Posture plays in both July and August issues.

"Health Education in Schools in the Metropolitan Health Demonstration Area," by Nina B. Lamkin and Mary E. Du Paul. *Quarterly Bulletin,* Milbank Memorial Fund, 49 Wall St., New York, N. Y., July, 1929. *Free.*

"Teaching Health in Schools." A reprint outlining the new state program of the State Charities Aid Association, covering health protection, health teaching, and health development. S. C. A. A., 105 East 22d St., New York, N. Y. *2 cents.*

"Your Nearest 'Service Station.'" A list of various units of the National Council to which correspondence about educational material may be addressed. *The Dairy Council,* 307 North Michigan Ave., Chicago, Ill., June–July, 1929. *Free.*

PUBLICITY NEEDED

"What Price Publicity," by Elsie M. Maurer. *Trained Nurse,* June, 1929, pp. 751–755. The need of more high grade applicants for training; the need of publicity in recruiting; how interviews, talks to visitors, correspondence and other routine contacts may have a far reaching importance unsuspected at the time.

DIPHTHERIA

The Illinois State Department of Health is distributing to physicians a display card advising parents to have their children immunized.

An anti-diphtheria cartoon from the *New York Evening World* appears in *Weekly Bulletin,* New York City Dept. of Health, July 6, 1929.

"What is Diphtheria?" is a 4-page mimeographed article distributed for reproduction in all countries. League of Red Cross Societies, 2, Avenue Velasquez, Paris, 8, France.

Three short paragraphs of explanation and history in *Time,* July 29, 1929, p. 50. Also New York City's use in July of street cleaning trucks as "healthmobiles."

MAGAZINE ARTICLES

"About Face," by Ruth F. Wadsworth. *Collier's,* Aug. 10, 1929. Beauty and the liver.

"Air Raids on Mosquitoes," by S. R. Winters. *Aeronautics.* In *Literary Digest,* June 29, 1929.

"Diet and Appetite," by T. Swann Harding. *Harpers,* Aug., 1929, pp. 361–369.

"Diet and the Duration of Life," by James A. Tobey. *American Mercury,* July, 1929.

"Too Much Tooth Pulling." *Journal of Indiana State Medical Assn.* In *Literary Digest,* July 6, 1929.

RADIO

Margaret Deland broadcast for the Massachusetts Social Hygiene Society recently.

"Have You a Family Doctor?" shows how the conversational form of expression and the economical use of words may result in a highly effective radio talk. *Health,* Dept. of Health, New Haven, Conn., July, 1929. *Free.*

A group of mouth hygiene talks—habits which affect teeth, why and when to straighten teeth, results of decay, what teeth should be extracted. *J. Am. Dental Assn.*, 58 East Washington St., Chicago, Ill., Sept., 1929.

"Health Hazards of Vacation Time"—a radio talk given July 2 when most people were all agog for a vacation, with or without "hazards." But the last paragraph of that radio talk was about "Goblins." It would have made a snappy lead for the talk—especially if the title had been changed to "Vacation Goblins."—*Conn. Health Bull.*, State Dept. of Health, July, 1929. *Free.*

HOUSE ORGANS

The mimeographed *Bulletin*, Board of Health, Middletown, N. Y., carries "home-made" illustrations in every issue, and the envelope used in mailing bears a new illustrated return card for every issue. *Free.*

Having asked its readers as to the value of the *Bulletin*, National Tuberculosis Association, the responses have determined its continuance with some changes in the editorial program.

"A List of Health Magazines in the United States" classified them as national, state or local. An attempt has been made to define the contents of the different publications. National Health Council, 370 7th Ave., New York, N. Y., May, 1929. 10 cents.

"The Feet and Their Care," in *Chicago's Health*, Dept. of Health, Chicago, Ill., Apr. 30, 1929. Good material for folder and other uses. *Free.*

"Serving the Destitute Sick," *Community Fund News*, 51 Warren Ave., W., Detroit, Mich., June, 1929. *Free.* On services rendered by doctors; record of free services in connection with one hospital. Quoting such statistics in the lead of a press release would carry the rest of the story in most newspapers.

TITLES AND PHRASES

"Feeding a Crabby Husband on Hot Summer Days." *Northwestern Health Journal*, St. Paul, Minn., July, 1929. *10 cents.*

"The Hunger Strike in Infants." *Child Health Bulletin*, 370 7th Ave., New York, N. Y., July, 1929.

"Mad Dog!" *Hygeia*, August, 1929.

"Midsummer Traffic Madness"; "Canned Vitamines." *Better Health*, Dept. of Health, Syracuse, N. Y., July, 1929.

"The Misery Clinic" ("where those with unruly nerves may find help and understanding"); "The Girl Who Grew Up Too Soon" ("the serious, responsible little old man or woman"). *Hygeia*, July, 1929.

"Modern Sun Worshipers." Radio Health Talk No. 370, New York State Dept. of Health. *Free.*

"What a Baby Thinks About in Hot Weather." *Weekly Health Bulletin*, Connecticut State Dept. of Health, July 8, 1929.

"When Life Becomes a Burden" ("morbid fears of worriers and melancholics"); "The Human Mixing Bowl" (mouth hygiene). *Popular Health*, Minneapolis, Minn., June, 1929. *15 cents.*

BOOKS AND REPORTS

Teaching Health in Fargo—*By Maud A. Brown. New York: Commonwealth Fund,* 1929. 142 pp. Price, $1.50.

The tyro at reviewing who has the temerity to rush in upon *Teaching Health in Fargo* finds two pitfalls—the charm of the writing and the convincing way in which the subject is presented. Let it be repeated, Miss Brown writes. She does not grind out words, and in this respect her book is quite unique in health literature. Colorful expression, delicately humorous critical comments, and amusing illustrations in both words and pictures, all go to make the book a delight to the reader.

Then the presentation seems so rational, so obviously practical that the reviewer is tempted to sling superlatives like a school girl; so we become hypercritical and arm ourselves against the charm and persuasiveness of this little book as we subject it to caustic scrutiny. Is the conception new and worth reporting? Are the proposals sound pedagogy? Are the methods really practical under work-a-day conditions?

Certainly health educational schemes are as numerous as they are various. Projects, devices, concepts have all been tried piecemeal here, there, and everywhere. The outstanding contribution of the Fargo demonstration appears to be the wholesome teacher participation in planning as well as carrying out the scheme, for here was no predigested health educational pap jammed down the throats of mildly protesting teachers by some outside agency. This alone would make the demonstration worth reporting.

That its methods are sound pedagogically, those who have thought about health teaching will be fairly sure, for there will be found few artificial rewards to stimulate cupidity rather than health habits, and whenever tactful health educators work with normally interested, coöperative, and intelligent teachers, the methods should produce results in a measure comparable to those secured in Fargo. So we admit that caustic scrutiny fails to jar the enthusiasm of first reading. Sanitarians having to do with health teaching will enjoy and profit by this book, and they will want to get it quickly into the hands of those responsible for the health of school children if it is not already there.

RAYMOND S. PATTERSON

Stephen Hales, D.D., F.R.S. An Eighteenth Century Biography—*By A. E. Clark-Kennedy, M.D., M.R.C.P. New York: Macmillan,* 1929. 256 pp. Price, $6.00.

In 1927, Corpus Christi College, Cambridge, celebrated the 250th anniversary of Stephen Hales, and the author was selected to give the commemoration address. So much material was found that it was impossible to include it in an ordinary address, and the present work was written to complete the story of this remarkable man.

Although a clergyman, the name of Hales will always be connected with early experimental physiology and botany. He studied the ventilation of jails and ships, and devised apparatus for its improvement. His well known experiments on animals were a study of the blood pressure, and he was the first to introduce a cannula into the vessels and observe the height to which the blood would rise in a vertical glass tube. He studied the air, did re-breathing experiments, and concluded that it was through the peculiar properties of air

" that the main and principal operations of nature are carried out."

His life has particular interest for Americans because of his connection with the development of what is now the state of Georgia, which " was founded in an attempt to remedy the social conditions of England. . . . Georgia was both a philanthropic and an imperialistic enterprise."

One is somewhat astounded at the variety of his interests and the excellence of his work in each. He was perpetual curate of Teddington, and served that living for more than fifty years. He was a preacher of no mean ability, a plant and animal physiologist, one of our earliest hygienists and sanitarians, but in spite of all this he went wrong on a supposed cure for stone in the bladder, consisting of calcined snails, wild carrot seeds, burdock seeds, ashen keys, hips and haws, all burned to blackness, soap and honey, invented by one Joanna Stephens, though he was severe in dealing with other quacks. In this connection, he carried out a number of experiments in attempting to dissolve stones which had been removed, and in spite of his lack of success fell into the error of backing this particular cure.

As a biography, the work is exceptionally well done. The illustrations are numerous and beautiful, and prove Hales's ingènuity in devising and making such apparatus as well as his genius in working up the scientific problems. The author closes with an adaptation of words of John Wesley: " how well did science and religion agree in this man of sound understanding."

M. P. RAVENEL

Adventures in Health—*By Natalie Forbes Moulton. Boston: Little, Brown,* 1928. 140 pp. Price, $.70.

Buddie and Blossom have a series of adventures, first with the vegetables in the garden, then with animals who give them a lesson in the care of their teeth, with water and cleanliness, play times in the sunshine and numerous other incidents that indirectly teach the lessons of healthful living. This author, whose " Brownies' Health Book " has been so popular among teachers and primary grade children, has prepared another charming and interesting supplementary health reader. It has been delightfully illustrated by Eloise Burns.

ANNA B. TOWSE

Diseases of the Thyroid Gland—*By Arthur E. Hertzler, M.D. St. Louis: Mosby,* 1929. 286 pp. Price, $7.50.

Frankness, honesty and clarity are outstanding in this work of Hertzler. He is perfectly honest in stating the deficiencies in our knowledge of the thyroid, our ignorance of the etiology of even the commoner lesions, and the causes of the clinical manifestations. In stating these deficiencies, however, he opens up fields for further and new studies.

The subject matter and the material from which it is drawn are taken up by a master of pathology who in his zeal as a clinician and surgeon does not lose sight of the pathologic background—the cause of the disease, its manifestations, its progress and result. He views the problem from the point of the practical application of his science to the benefit and relief of the patient.

In studies of the thyroid, if the classification and terminology of its diseases were presented as Hertzler has done, in a clear, simple manner, there would be less confusion and misunderstanding. Clinicians and pathologists often lack in agreement of opinion concerning a thyroid, or a particular type or group of thyroids. This often does not represent a real difference, but a lack of proper understanding of these glands, and a common nomenclature and classification. Accurate clinical observations, gross and microscopic studies of the

gland should be available before a diagnosis is made on a thyroid.

It is a relief to read a present-day book on medicine in which the writer acknowledges the full value of laboratory work, but still insists upon the *tactus eruditus* of the "old school of medicine" that gave such men as Gross, Fenger and Senn.

By homely idioms and comparisons, Hertzler drives home many important facts that might otherwise receive little attention. He simplifies diseases of the thyroid to an extreme degree, yet omits none of the impressions and opinions of others whose writings often show such confusion of terms as to lose value when one tries to read, interpret and apply them.

The numerous illustrations are exceptionally good, well chosen and actually illustrate. M. PINSON NEAL

Who's Who among the Microbes—*By William H. Park, M.D., and Anna W. Williams, M.D. New York: Century,* 1929. 302 pp. Price, $3.00.

Good Health—*By Ian S. Thomson, M.D., D.P.H. New York: Longmans, Green,* 1929. 122 pp. Price, $1.40.

There is certainly no excuse for the public to remain in ignorance of the fundamentals of preventive medicine or medicine in general, as for some years past numbers of books—good, bad, and indifferent—have appeared, written for the general public, all of them couched in language intended to be non-technical.

The book by Park and Williams is the outcome of a series of radio talks on communicable diseases and the germs which cause them. It ends with a chapter showing the application of bacteriology to the ordinary affairs of life, and contains a number of simple illustrations, most of which are good.

The book by Thomson is different from the general run, and has the advantage of being much smaller. It goes more into the symptoms of the diseases spoken of, though cause and prevention are not neglected. Thomson is the son of Professor J. Arthur Thomson, than whom there is no better expositor of the biological sciences writing in the English language. This is the first book of his which has come to the reviewer's notice, but we hope it will not be the last.

Both of these books can be recommended without hesitation to those who, without special training in biology and medicine, wish to understand the fundamental laws of health and the reasons which underlie them.

M. P. RAVENEL

Oeuvres de Pasteur—*Tome 5. Etudes sur la bière, réunies par Pasteur Vallery-Radot. Paris: Masson & Cie,* 1928. viii + 361 pp., 12 pls., 85 figs. in text. Price, 120 francs.

The fifth volume of the collected works of Louis Pasteur edited by Pasteur Vallery-Radot contains the famous monograph on the diseases of beer, the causes which induce them, and the means of preserving beer from alteration. This investigation has a significant position in the historical development of Pasteur's career and is revealed in the phrase appended to the main title of the monograph, to wit: "with a new theory of fermentation."

This investigation afforded Pasteur another opportunity to reënforce his proofs of the non-spontaneity of germs, of the non-transformation of one species of microscopic germ into another species, and gave him the occasion to monograph the yeasts associated with alcoholic fermentation.

This monograph also records a notable expansion of Pasteur's comprehension of the significance of his discoveries as revealed in his chapter on the physiological theory of fermentation. In

this he concluded that fermentation is a very general phenomenon. It is life without air; it is life without free oxygen.

It is prophetic of his later achievements to find him asking if beer and wine undergo such profound alterations because they have given asylum to invisible microscopic organisms introduced by chance into their midst where they thrive, how can one escape the thought that facts of the same order might and should present themselves sometimes in man and animals.

A few supplemental papers in this field which were published in conjunction with the monograph and in later years, are added.

The epigraph from Bossuet with which Pasteur introduced this investigation might well shed its stimulating and restraining influence in every laboratory. "Le plus déréglement de l'esprit est de croire les choses parce qu'on veut qu'elles soient." C. A. KOFOID

Who's Who in America. Vol. 15, 1928–1929—*Edited by Albert Nelson Marquis. Chicago: A. N. Marquis Co.* 2488 pp. Price, $8.50.

In this, the 15th volume of this interesting and valuable compilation of the great, the near great, the celebrated, the noted and the notorious, there are 28,805 biographical sketches of living men and women who, the publishers are careful to state, are the "best known," though not necessarily the "best," in the United States.

On the whole, the public health profession is well represented and most of those who have attained renown in the field of sanitary science seem to be included. There are, however, some peculiar omissions. One looks in vain for the names of the health commissioners of several of our largest cities, and many of the state health officers are not among the elect. This fact may or may not be to the discredit of the editors who chose the personalities worth attention, but since certain legislators and high officers of the military forces are automatically included, regardless of their achievements, sanitarians in high official places might be so favored. Perhaps they are, but changes in office are so rapid that the editors cannot keep up with them.

It is, of course, too much of a task to attempt to take a census of all the sanitarians in *Who's Who*. The reviewer has, however, counted at least 21 sanitarians among the approximately 3,000 names beginning with "B." Among the 4,000 or so members of the American Public Health Association are more than 300 whose names commence with "B." Since the proportion of persons included in *Who's Who* is about one to every 4,000 of our total population, the ratio of sanitarians seems satisfactory. There are, of course, many practitioners of medicine listed in addition; and a few osteopaths, not to mention one or two naturopaths.

Sixty-four per cent of those mentioned in *Who's Who* are college graduates, and a number of others have had some college training, which is an interesting commentary on the value of an education, and is, no doubt, one reason for the 176 pages of advertisements of educational institutions at the back of the volume.

Who's Who is a reference book which should be in every library. It is interesting reading, for the perusal of biography is always worth while and not without inspiration. The book is well printed and arranged, and apparently unusually free from errors. Sanitarians will have many occasions to consult such a work.

Some day we may also have a separate volume devoted exclusively to Who's Who in public health. It would probably cost more than it would earn as a publishing venture, but it would serve a useful purpose.

JAMES A. TOBEY

Eat, Drink and Be Slender—*By Clarence W. Lieb, M.D. New York: The John Day Company,* 1929. 193 pp. Price, $2.00.

This addition to the outpourings on how to reduce is intended for general popular consumption. As such, it is a useful book, for the style is interesting and the facts are sound, with proper emphasis on the desirability of the prospective reducer consulting his or her physician. The book is divided into three parts, the first on the three types of obesity, the second on health hazards and complications, and the third on methods of reducing. Each has numerous short sections containing much of an epigrammatic nature. Physicians and sanitarians can recommend this book to their public with comparative impunity. JAMES A. TOBEY

Nursing Mental Diseases—*By Harriet Bailey, R.N. (2d ed. rev.) New York: Macmillan,* 1929. 294 pp. Price, $2.00.

It is difficult to conceive of a treatment of this subject that could be more complete or up-to-date or more clear and simple. The first edition has been held among nurses as a standard for psychiatric nursing and there is every reason to believe the revised edition will hold the same high place among them.

From a psychological introduction the author goes on to the history of the care of the mentally sick, to some legal aspects of mental disorders, and to the prevention of mental disease, before taking up the symptoms. She quotes an eminent physician as saying, "While signs are the province of the doctor, symptoms are in a peculiar way that of the nurse." For each type of psychosis she has given the physical symptoms, the mental symptoms, then the nursing procedures, followed by very helpful hints as to the simple occupations these patients can best take part in to keep them busy and happy and assist in bringing them back to health.

There are also good chapters on therapeutic measures and hydrotherapy.

The book should not only be the stand-by of every psychiatric nurse, but of every active nurse, for different grades of mental illness appear in all classes of patients whether they are in hospitals or their own homes. Moreover, if all nurses read this book more of them would take up psychiatric nursing, for Miss Bailey has made it evident to what extent judgment, tact, emotional stability, ingenuity and human understanding are necessary characteristics of the nurses who work with those mentally diseased.

The book is written in fairly large print and is easy to read. There is a good glossary. EVA F. MACDOUGALL

Die Menschenthymus in Gesundheit und Krankheit—*Ergebnisse der numerischen Analyse von mehr als Tausend menschlichen Thymusdrüsen. Teil II. Das Organ unter anormalen Körperverhältnissen. Zugleich Grundlagen der Theorie der Thymusfunktion. Von J. Aug. Hammar. Leipzig: Akademische Verlagsgesellschaft,* 1929. xii + 1114 pp. (815 figs.) Price, 128 M.

This is the concluding volume of Dr. Hammar's monumental study of the human thymus based on 25 years of intensive study and the analysis of over 1,000 cases of critical examination of the thymus, 800 of which were after death by disease or following some abnormal condition.

The present volume opens with a discussion of the general pathological anatomy of the thymus. This is followed by a general consideration of the physiological questions arising from the anatomical and pathological conditions of the gland and experiments based thereon. The functions of the thymus as revealed by the facts thus far ac-

quired are reviewed and this is followed by a chapter on the methodology of the investigation, well worthy of consideration by all who seek to analyse the causes of disease. The greater part of the work is taken up with detailed analyses of the conditions found in the thymus following death by the more prevalent diseases from influenza to lues.

Dr. Hammar regards the thymus as essentially an epithelial organ and Hassall's corpuscles as constituting the significant part. It is in them that hypertrophy and degeneration occur. The lymphocytes in the parenchyma are invaders subject to the action of factors modifying lymphocytes generally in the body, though they are subject also to a direct correlation with the epithelial portion of the thymus. An abundance of lymphocytes is a condition of the preservation of the epithelial components and is indicative of normal function.

The histological analysis and experiments based thereon lead to the conclusion that Hassall's corpuscles increase under the stimulus of certain toxins exogenous and endogenous in origin. The physiological evidence indicates that the thymus exercises a protective action against certain toxins.

C. A. KOFOID

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

The I. C. N. Congress—A résumé of the meetings of the Montreal Congress of the International Council of Nurses includes brief excerpts from some of the important papers.

ANON. The Congress of the International Council of Nurses. Pub. Health Nurse, 21, 8: 397 (Aug.), 1929.

Tetanus and Vaccination—Tetanus occurred in conjunction with vaccination only when some type of dressing was strapped to the arm. Deep implantation of the bacillus is necessary, which is permitted by a tight dressing. Openly treated vaccinations are free from this complication.

ARMSTRONG, C. The Rôle of the Vaccination Dressing in the Production of Postvaccinal Tetanus. Pub. Health Rep., 44, 31: 1871 (Aug. 2), 1929.

Good Shoes—Why feet go wrong and how they can obtain relief through good shoes is the theme of this uninspired series of wordy paragraphs.

BUKA, A. J. The Foot and the Shoe. J. A. M. A., 93, 6: 445 (Aug. 10), 1929.

Physical Defects and Intelligence—Physical examinations of more than 14,000 retarded school children in Massachusetts demonstrate the positive association, between the factors of physical defect and lower level of intelligence. Excellently illustrated with graphs.

DAYTON, N. A. The Relationship between Physical Defects and Intelligence. New England J. Med., 201, 6: 245 (Aug. 8), 1929.

Malaria Control Measures—Briefly reviews present-day methods for malaria control.

WILLIAMS, L. L., JR. Current Malaria Studies with Special Reference to Control Measures. Pub. Health Rep., 44, 33: 2001 (Aug. 16), 1929.

Health Nursing Problems—How to extend nursing service, to coöperate with fellow workers, to establish permanency, and a half dozen other important questions are presented and discussed ably in this paper.

GARDNER, M. S. Modern Problems in the Public Health Nursing Field. Pub. Health Nurse, 21, 8: 413 (Aug.), 1929.

Tests for Syphilis—The League of Nations conducted a competition to allow the proponents of the many diagnostic tests to demonstrate the advantages of each. At the conclusion, the conference recommended that two tests be used.

KAHN, R. L. The League of Nations Conference on Laboratory Tests for Syphilis. J. A. M. A., 93, 5: 351 (Aug. 3), 1929.

Wassermann or Kahn?—Another comparative study of the Wassermann (Kolmer modification) and Kahn leads these authors to believe that the Kolmer-Wassermann test is the more accurate, but both tests are recommended.

MCINTYRE, M. C., and GILMAN, R. L. Serologic Studies. J. A. M. A., 93, 5: 358 (Aug. 3), 1929.

Toxin-Antitoxin or Toxoid—The authors are of the opinion "that toxoid merits the preference in the choice of an immunizing agent in the prophylaxis of diphtheria." Score another for toxoid.

WEINFELD, G. F., and COOPERSTOCK, M. Comparative Effects of Diphtheria Toxoid and Toxin-Antitoxin as Immunizing Agents. Am. J. Dis. Child, 38, 1: 35 (July), 1929.

Impounded Waters—Should boating, bathing, fishing be permitted in impounded reservoirs? The author's opinion is that a freer use than is usually the practice may be allowed, providing precautions are taken.

ROSENTHAL, H. The Protection of Impounded Reservoirs. J. Am. Water Works A., 21, 8: 1054 (Aug.), 1929.

Industrial Tuberculosis—Chest injury, either trauma or by diseases related to injury, usually is the cause of the development or reactivation of the tuberculous process in industrial cases.

SHIPMAN, S. J. Industrial Tuberculosis. J. A. M. A., 93, 4: 257 (July 27), 1929.

Economic Status and Disease—Statistics are presented which show, what every sanitarian believed, that the illness rate is higher among the poor and that such people get less medical attention. Well, these figures will serve many a perplexed orator who is in need of just such help for his cause.

SYDENSTRICKER, E. Economic Status and the Incidence of Illness. Pub. Health Rep., 44, 30: 1821 (July 26), 1929.

Evaluating Sanitary Progress—The enthusiast who rushes in to "prove" the value of his pet panacea should read this sane discussion of the progress in public health.

ROATTA, G. B. Developments in the Public Health Field. Pub. Health Nurse, 21, 8: 403 (Aug.), 1929.

Early Symptoms of Tuberculosis—Cough, easily tired, loss of weight, appetite, pain in chest were the early symptoms most commonly met in an examination of 1,500 patients. Though these symptoms spurred the patient to be examined, physicians were frequently unable to establish a positive diagnosis.

WILLIAMS, L. R., and HILL, A. M. The Appearance of the Symptoms of Tuberculosis. J. A. M. A., 93, 8: 579 (Aug. 24), 1929.

Contributions of Hermann M. Biggs—The sanitary advances of the past fifty years and the leadership of Hermann M. Biggs are ably portrayed in this delightful memorial lecture.

WINSLOW, C.-E. A. The Contribution of Hermann M. Biggs to Public Health. Rev. Tuberc., 20, 1: 1 (July), 1929.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

East Orange, N. J.—The new health department building, according to the 1928 report, is one of a group of city buildings which form a civic center. Plans have been made for administrative offices to house the commissioners and health officer, the sanitary inspection, nursing, vital statistics and communicable disease divisions, and also for a completely equipped laboratory, and two principal clinics—one for the care of infants and children, the other for adults, including food handler examinations, venereal disease diagnosis and treatment, and such other functions as may develop in the future. As a means of enlarging the educational activities of the department, a small assembly hall will be available for lecture and conference purposes.

During the year standard swimming pool regulations have been prepared, and rules have been adopted for the quarantine of persons exposed to chickenpox and mumps, and for discontinuing the destruction or fumigation of books from quarantined premises. Health practices, based on the *Appraisal Form*, score 848 out of a possible 1,000 points.

The estimated population of the city is 68,764, and the figures are classified by wards, color, and nationality. Of 931 births, 74 per cent occurred in hospitals, while only 4.9 per cent were attended by midwives. While the native white parents constituted 82.5 per cent of the population, only 63.3 per cent of the births belong in this group. A death rate of 9.8 per 1,000 population compares with 9.0 in 1927, and 11.8 for the years 1914–1918. Of the total 681 deaths, 73.3 per cent were in the age group 45 years and over. An infant mortality rate of 43 per 1,000 births is noteworthy. There were only 21 deaths from tuberculosis, including residents who died in distant sanatoriums and out of town institutions, giving a specific rate of 31 for the year.

Data are presented to show the results of medical examination of food handlers under the provisions of the local ordinance.

While the value of this work from the point of view of actually preventing infection from foodstuffs may be questioned, there can be no doubt that the discovery of these chronic defects is of the greatest value to the individual concerned, and the elimination of those suffering with skin infections of any kind is certainly a sound hygienic and esthetic requirement. The fact that for the first time no skin infection or syphilis was discovered during the year would seem to indicate that such persons, knowing the requirements in this city, no longer apply for employment here, or that the employers themselves are more particular whom they engage.

Baltimore, Md.—This city reports a population in 1928 of 830,370, a birth rate of 19.06, and a death rate of 14.36. Extensive statistical tables indicate the trends of disease for the past 9 years. The Bureau of Communicable Diseases reports special work in culturing convalescent cases of scarlet fever with a view to lessening the quarantine period, but thus far it is the impression that the present period of 21 days cannot be shortened. Special culture methods devised for whooping cough cases are considered of some value both in the diagnosis of and release from quarantine of cases of whooping cough. A large number of examinations of urine and feces, mainly of food handlers, has resulted in

the detection of some typhoid and paratyphoid carriers and their elimination as food handlers.

Two interesting outbreaks of food poisoning are reported, one traced to chicken salad and affecting 27 out of 29 persons, characterized by violence of onset and great prostration of the victims; the other traced to chicken patties served at a church supper, affecting 140 persons and characterized by cramps and diarrhea, without prostration. In both cases organisms of the *Salmonella* group were isolated. In both cases the chicken had been cooked at least one day before serving and had been kept without proper refrigeration or adequate protection from contamination.

The outstanding epidemiological occurrence during the year was a wave of poliomyelitis representing the greatest incidence since 1916, a total of 126 cases being reported. There was an early seasonal incidence, with an abrupt decline about September 1, and a low fatality rate. Investigations showed that more than half of the cases received hospital care; 83 cases received serum; of 49 cases given serum before paralysis, 94 per cent entirely recovered; by February 1929, more than half of all the cases had entirely recovered.

This report of 276 pages contains a table of contents at the front and an alphabetical index at the back. It is well printed and carefully prepared.

BOOKS RECEIVED

THE ROAD TO HEALTH. By C.-E. A. Winslow. New York: Macmillan, 1929. 151 pp. Price, $2.00.

THE MODERN DANCE OF DEATH. By Peyton Rous. New York: Macmillan, 1929. 51 pp. Price, $1.00.

RECENT ADVANCES IN PULMONARY TUBERCULOSIS. By L. S. T. Burrell. Philadelphia: Blakiston, 1929. 215 pp. Price, $3.50.

OUTLINE OF PREVENTIVE MEDICINE. For Medical Practitioners and Students. Prepared under the Auspices of the Committee on Public Health Relations, New York Academy of Medicine. New York: Paul B. Hoeber, 1929. 398 pp. Price, $5.00.

THE COMMON HEAD COLD AND ITS COMPLICATIONS. By Walter A. Wells. New York: Macmillan, 1929. 225 pp. Price, $2.75.

EAT AND BE HAPPY. By Josiah Oldfield. New York: Appleton, 1929. 115 pp. Price, $1.50.

STORIES OF HEALTH AND HAPPINESS. By Elizabeth B. Jenkins and C.-E. A. Winslow. New York: Merrill, 1929. 163 pp. Price, $.68.

PHYSICAL WELFARE OF THE SCHOOL CHILD. By Charles H. Keene. New York: Houghton Mifflin, 1929. 505 pp. Price, $2.40.

EAT, DRINK AND BE SLENDER. What Every Overweight Person Should Know and Do. By Clarence W. Lieb. New York: Day, 1929. 194 pp. Price, $2.00.

HEALTH EDUCATION TESTS. SCHOOL HEALTH RESEARCH MONOGRAPHS No. 1. By Raymond Franzen. New York: American Child Health Association, 1929. 70 pp. Price, Paper, $.60; Cloth, $.90.

SEVEN STANDARD CAPACITIES, 1930. Pfeatherwaite Truck Tank, Bulletin 707. Rochester: The Pfaudler Co., 1929.

COMBINED SINUS AND DUODENAL INFECTIONS. By S. Peskind. Cleveland: Author. 20 pp.

ARCHIVES DE HYGIENE. 1927, 1928 and 1929. Publicacao do D. N. de Saude Publica, Rio de Janeiro.

OEUVRES DE PASTEUR. TOME V. ETUDES SUR LA BIERE. By Pasteur Vallery-Radot. Paris: Masson et Cie, 1928. 357 pp. Price, 120 Fr.

PRACTICAL HANDBOOK FOR DIABETIC PATIENTS. By Abraham Rudy. Boston: Barrows, 1929. 180 pp. Price, $2.00.

NEWS FROM THE FIELD

RABIES

SHIRLEY W. Wynne, M.D., Health Commissioner of New York, N. Y., warned the people recently that a bite is not necessary in order for a dog to transmit rabies. The germ is carried in the saliva, and if a person touches the saliva of a rabid dog, he is exposed to the disease.

Dr. Wynne also asserted that it is a mistake to kill all dogs suspected of having rabies. " The animal should be isolated and observed. If he lives a week, it is a certain indication that he is not rabid."

CHILD HYGIENE IN MEXICO

FOR the purpose of combating infant mortality, which in Mexico City is 280 deaths per 1,000 live births, and is even higher in other parts of the country, the federal government issued a decree on May 10, 1929, establishing a Bureau of Child Hygiene (Servicio de Higiene Infantil) in the Federal Department of Public Health.

NATIONAL SCHOOL OF PUERICULTURE

IN Mexico City, a " national school of puericulture " is to be established for teaching care of the child to graduate physicians, medical students, and laymen. Special courses are also to be given for public health officers, employees of the child-hygiene clinic, and visiting nurses.

MILBANK MEMORIAL FUND AIDS EAST HARLEM HEALTH CENTER

THE Milbank Memorial Fund has donated $50,000 to the East Harlem Health Center toward the new 16-story health center, combining an apartment house with completely equipped clinics. This building has been planned by the health center.

OHIO HEALTH COMMISSIONERS

THE Tenth Annual Conference of the Ohio Health Commissioners and the Fourth Annual Meeting of the Ohio Society of Sanitarians will be held at the Neil House, Columbus, O., on November 19 to 22 inclusive. The program of the Ohio Society of Sanitarians has tentatively been allotted to Wednesday afternoon and evening, November 20, and Thursday morning, November 21.

MEASURES AGAINST ILLITERACY IN CHILE

THE President of Chile in his message to Congress of May 21, 1929, discussed, among other things, illiteracy in that country. He spoke of his intention to present to Congress a bill aiming to reduce illiteracy and urged the citizens, particularly employers, to do their share in the promotion of primary education.

In the last year 100 million pesos were appropriated for primary education, and a contract was made with a United States firm for the construction or repair of nearly 600 schools within a period of 5 years.

WORLD MEDICAL CONGRESS

THE thirteenth triennial meeting of the International Physiological Congress took place in Cambridge, Mass., August 19 to 23.

Delegates numbering more than 1,000, from every quarter of the civilized world, were in attendance. Prof. William H. Howell of the Johns Hopkins University was the president of the congress.

This was the first time this group has met in the United States, and it was officially the guest of the American Physiological Society and the Federation of American Societies for Experimental Biology.

INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS ORGANIZED

WORD has been received from Scheveningen, Holland, of the formation of an international association for the prevention of blindness, following the meetings of the International Ophthalmological Congress. The League of Red Cross Societies recently made public the report of a 2-years' study of the prevalence of blindness and the principal causes for loss of vision throughout the world, which was made in coöperation with the National Society for the Prevention of Blindness. This was largely instrumental in the formation of the international association.

PERSONALS

DR. THOMAS O. LUCKETT has been appointed Health Officer of El Centro, Calif., to succeed Dr. F. A. Burger.

DR. MAY I. MILLBROOK, of Biwabik, Minn., has been appointed medical adviser to women at the University of Illinois.

DR. JAMES N. BUCHANAN has been appointed Health Officer of Freeport, Ill. He succeeds Dr. Elmer H. Best, who died recently.

DR. GEORGE D. HEATH, JR., who was Health Commissioner of Bloomington, Ill., has been appointed Health Commissioner of Florence, S. C., which position was left open through the death of Dr. Percy H. Brigham.

DR. HAROLD HERMAN ASH, of Reynolds, Ind., is the new Health Officer of White County, Ind.

DR. ENRIQUE HUG has been elected professor of pharmacology in the Faculty of Medicine of Littoral, which is a branch of the faculty of Rosario, Buenos Aires.

DR. FRED BIRD, Melbourne, Australia, died on May 29. He was a prominent surgeon of Melbourne.

DR. MELVILLE G. DANSKIN, Glendive, Mont., was elected president of the Montana Public Health Association on July 16.

DR. LEON BANOV, of Charleston, S. C., has been elected president of the South Carolina Public Health Association.

DR. JOHN FERGUSON of Toronto, Canada, was elected president of the Ontario Medical Association.

DR. CHARLES J. C. O. HASTINGS has resigned as Medical Officer of Health of Toronto, Canada. Dr. Hastings has served for 19 years.

CONFERENCES

Oct. 7–9, International Assn. of Dairy and Milk Inspectors, Memphis, Tenn.

Oct. 14–18, American College of Surgeons, Chicago, Ill.

Oct. 21–23, Missouri Water and Sewerage Conference, Chillicothe, Mo.

Oct. 21–25, Inter-State Postgraduate Medical Association of North America, Detroit, Mich.

Oct. 22–24, New York State Nurses' Association, Buffalo, N. Y.

Oct. 24–26, International Association of Milk Dealers, Toronto, Can.

Nov. 4–7, 8th Annual Meeting of the American College of Therapy, Chicago, Ill.

Nov. 11–13, National Society for the Prevention of Blindness, St. Louis, Mo.

Nov. 20–22, Southern Medical Association, Miami, Fla.

Dec. 3–5, 7th Texas Sanitary Short School, Edinburg, Tex.

Dec. 6–7, New Jersey Public Health and Sanitary Association, Asbury Park, N. J.

Dec. 25–Jan. 1, Society of American Bacteriologists, Ames, Ia.

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Public Health Control*

GEORGE W. FULLER, FELLOW A. P. H. A.

Consulting Engineer, New York, N. Y.

PROGRESS in the public health field during the life of this Association has been enormous. The results are not due solely to any one group of workers—professional, technical or administrative—but have been accomplished by activities in many channels. During the past 40 to 50 years, we have played a prominent part in extending the average length of life of the American people from about 40 to 58 years. This result applies to the expectancy at birth, but is due principally to the salvage of the younger age groups rather than to the extension of the age span of the older age groups.

While racial and other factors are important in our present death rates it is certain that there is much work yet to be done in this country, since in Australia and the Scandinavian countries, expectancy at birth has become about 65 years. It is also highly significant that in the United States alone there are 750,000 lives lost annually due to preventable disease and 25,000,000 persons who are below par physically. It is hardly believable that nearly 2,500,000 persons are constantly sick and that 300,000,000 days of work are lost annually due to illness, with terrific monetary losses—directly due to the cost of medical care, and indirectly to loss of employment.

Generally speaking, the American people no longer live in dread of Asiatic cholera, plague, yellow fever, virulent smallpox or pernicious malaria. There has been a profound lessening of the deaths from typhoid fever, diarrhea and other diseases known to be water-borne, due to the team work of public health workers, physicians and engineers. During the past generation experiences indicate that under highly efficient control certain diseases will show greatly reduced

* Address of the President of the American Public Health Association, presented at the Fifty-eighth Annual Meeting at Minneapolis, Minn., September 30, 1929.

death rates. Typhoid fever and diarrheal diseases have been reduced to minor importance in progressive communities. The occurrence of a typhoid fever epidemic is now regarded as a revelation of community negligence. The communicable diseases generally are fast giving way before the offensive waged by preventive medicine—tuberculosis and diphtheria notably. Smallpox is practically nonexistent where vaccination is properly practiced. Where communities apply themselves properly to the problem, deaths from childbirth show a signal reduction.

The degree of reduction of morbidity and mortality has varied, of course, for different diseases and in different sections of the country. Also the conditions in some parts of the United States are so excellent that they atone statistically for the terribly high infant and general morbidity and mortality rates in certain communities.

We have much to celebrate in public health achievement. However, constructive action and future progress result not from reminiscing about the past and singing praise to our predecessors who richly deserve tribute, but rather from emphasizing our hopes and presenting our plans for achieving still greater benefits for the public welfare in the future.

Frequently it has been customary to deal in presidential addresses with some theme of technical interest, which the speaker has forborne doing in this instance. It seems of greater practical value to the organization to do a bit of accounting in a generous but searching and analytical spirit, and to ask how we stand as to carrying on the objective of the Association—which is to protect and promote public and personal health.

Public health control deals with the organized effort to eliminate disease, to elevate standards of health, and to increase the span of life. It is the application of sanitation and hygiene to individuals en masse. Public health activities have three main phases: First, the basic principles or theory upon which practice is founded; second, the administration and enforcement by health officials of the statute laws emanating from the principles of hygiene and sanitation; and finally, the development of an intelligent public opinion in order to secure legislative and financial support for health administration and research. In summary, therefore, public health control comprises technical knowledge, administrative practice, and public education.

Slow progress in the past was due in part to too much attention having been given to details representing the views of one person or another temporarily in a position of authority. Too little attention has been given to sound principles of organization and to sustained

continuity in the development of a broad program of procedure representing group judgment. The aim of this address is to suggest ways in which public health control may be advanced more rapidly.

RÔLE OF A. P. H. A.

For 58 years the American Public Health Association has been the leading professional organization of the North American continent for the formulation of procedures intended to improve public health control. It is not an official organization of administrative health officers but a professional society, which counts among its membership the leading health administrators of this continent. Its ten sections conduct important meetings annually for the improvement of the technical foundations upon which sound public health practice is based. It is true that there are other national organizations contributing to the broad field of public health; but only in the American Public Health Association have those specialties been developed and tested for nearly three score years and been made to bear on public health administration.

This Association is built on a tradition of service which has made it for the past 58 years the rallying place of public health administrators. Others may be interested in public health from many angles, but this Association seeks particularly to serve the administrator to the end that public welfare may be enhanced; that morbidity and mortality may be reduced, not by rhetorical phrases but by study and counsel as to the best technical methods. This leads naturally to the consideration of a function not uniformly well achieved, namely, standardization when periods of experimentation are at an end. Research to formulate standards in every branch that is collateral to public health service is peculiarly the objective of this Association. Whether it relates to the work of the statistician and the service he may render, the engineer, the nurse, the public health educator, the physician skilled in communicable disease control, the health battalions who watch over the health of school children, the industrial hygienists, or any other group—ours is the particular and peculiar business to advise specific methods of attack. We are an international board of strategy in health matters. Obviously it follows from this that the health officer must transmit and put into effect the theories and the principles of action that are discussed and given validity in this international clearing house.

It follows then that such a body as this should take cognizance of every problem of current interest. As these questions arise, we need effective machinery to interpret, with sound judgment, the specialized

knowledge of health administrators and educators of the North American continent, so that teachers, leading citizens, legislators, and the public at large may be informed and helped to a better understanding. We must have machinery to make vocal our ideas and our ideals.

Complexity of membership and of the interests involved in the A. P. H. A. does not lessen the responsibility of all concerned, to provide the opportunity for health officers to make this Association serve adequately as their professional society. Whether or not they take advantage of such an opportunity rests largely with them. Although the A. P. H. A. should be the rallying point for these sanitarians, it must be clearly borne in mind that it is a going concern with considerable strength as an association of the health officers' coworkers. It includes, in its sections, large numbers of those technically trained individuals who provide the scientific support for the health officers' work, to say nothing of the public health nurse.

At this point differentiation should be made between the professional administrative worker and the professional technical worker. The latter devotes his efforts to improvements in the scientific foundations of public health practice and to the diagnoses of results. To my mind, these technical workers, including engineers, laboratory men, statisticians, and others who constitute the respective sections of this Association, are not professional workers in the sense in which that term is used by some. They are primarily technicians engaged professionally in technical or scientific vocations.

They are not professional workers in the public health field in the sense of having authority to carry out administrative measures founded upon the police powers of the State, or being held responsible for the securing or disbursement of funds, control of personnel, or the establishment of rules or regulations. Yet, while appearing as subordinate, they play a vital part in the teamwork that is implied in the term public health administration.

The administrator must lean heavily upon his technical coworkers for the accuracy of his prescriptions—prescriptions which deal with problems of ventilation, sewage disposal, water supply, milk supply, and dairy products generally; problems of hygiene of the infant, the mother, the school child and the industrial worker; problems of statistics, education, and a host of other problems of daily or emergency occurrence. What is more logical than that there be a close merger between the technicians and those who must give effect and force to their prescriptions, through an Association such as this?

Looking now at the American Public Health Association in the light of the three principal lines of activity in the public health field,

we find that it is comparatively weak as a professional society of official health administrators; relatively strong as an association of technical health workers; and practically inactive as a force in molding public opinion, although we have a section well informed as to educational methods. The organization is capable of making still greater progress; but the set-up of the Association is such that it needs more clearly defined allocation of authority, and executive responsibility.

NEED FOR REORGANIZATION OF THE A. P. H. A.

Having tried to view the functions of the Association in proper perspective, I have felt that it was incumbent upon me during the year of my official service as the head of this organization to consider whether we were as adequately prepared to achieve our objectives, in the light of recent progress and development, as is necessary. In giving an accounting of my stewardship, I desire to inscribe in the history of the Association a record of reappraisal and of reconstruction where necessary.

An effort has been made to visualize a central organization that would better integrate the efforts of the technicians and professional men scattered over this vast expanse of territory from which we draw our membership. The details have been presented in the form of proposed amendments to the Constitution and By-laws, but little can you imagine the efforts that have been required to study these needs in a dispassionate way in order that the central organization may be made to be a still more effective clearing house of official public health work in America, and to serve better those whom it is intended to serve.

RESEARCH AND STANDARDS

Public health progress has been and will continue to be dependent in part on advancement in our knowledge of technical procedure. This in turn involves research and study, in an unbiased way, of statistical data and the results of research, so that after suitable discussion and publicity the promulgation of unified practice and so-called standards—at least tentative standards—may be forthcoming. Through the aid of the committees and sections of this Association, scientific progress is made more effectively than would be possible through the individual efforts of detached workers, regardless of their skill or the comprehensiveness of their performance. The open forum does a world of good even among scientists in separating the wheat from the chaff. To be effective, the discussion and coöperative actions of these individuals, however, need thorough organization.

In many associations there has been a tendency to take up a problem and proceed precipitously in the direction in which it is hoped to

find its solution. Suitable consideration is not given to the scope of the undertaking, either with reference to the adequacy of investigation, or the unbiased discussion of results. Naturally, the conclusiveness of the outcome is more or less jeopardized, and the securing of funds for a definite undertaking is made more difficult.

In advancing scientific knowledge in the field of public health, it is necessary, first, to take some of the more important of the proposed problems and develop them into what the business man calls a definite project. By that is meant that a reasonable inquiry should be made into the available evidence with respect to the given problem. Then ample study should be given to developing a program which comprehensively deals with the scope of the proposed undertaking. The personnel, time and funds needed should be carefully estimated; the prospects as to what advantages may be expected from the results should be weighed; and, finally, decision should be made as to whether such a comprehensive program is worth while. If it is worth while, the program for the development of the problem into a project should be reviewed, criticised, and decided upon in such a way that the enterprise may be sold to those who are in a position to contribute funds for its support. This necessity for translating problems into worthwhile projects, in order to secure financial support, is not always recognized.

There is no reason why financial support from industry should not be secured and accepted for research and standardization activities by the American Public Health Association; provided always that the proposed problems are adequately developed into meritorious projects, and carried out free from any bias in favor of the industry contributing funds. However much we may need the sinews of war to carry on research and standardization efforts we cannot place ourselves in a position which would compromise our dignity or reflect upon our dispassionate and scientific interest in public health.

Progress at a more rapid rate may be made in matters of research and standards if the American Public Health Association organizes more efficiently. Indirectly such advances should be of benefit to the Association in the third aspect of public health control, namely, public health education.

EDUCATION OF THE PUBLIC IN HEALTH MATTERS

The American Public Health Association has not progressed very far in educating the public in matters of personal hygiene, in supporting adequate legislation, or in improving salaries or tenure of office of health officers.

Its efforts to reach laymen who have a real interest in public health and other welfare undertakings have not been conspicuously successful, if we except the work of the Committee on Administrative Practice, with its recent contacts with Chambers of Commerce and the lectures on the Chautauqua platforms which the A. P. H. A. has directed through arrangements made possible by the Milbank Memorial Fund. The Association's progress, in a coöperative educational way, in affiliated state and regional societies has necessarily been slow.

Progress by voluntary health agencies as a whole, in the view of some, has been retarded by overlapping, uneconomical and uncoordinated efforts, particularly in the field of public health education. Too much attention by far has been given to details, and not enough to guiding principles of action. Efforts have been made to do too much at a time. So much attention has been given to examination of leaves and the characteristics of a few trees, that the relation of the forest to the whole landscape has not been clearly visualized.

It would probably be wise to place on the health officers of the A. P. H. A. the initial responsibility of selecting two or three aspects of public health which might reasonably be made the basis of effective education of the public. It would probably be feasible for the A. P. H. A. to invite other health agencies to attend a conference to adopt, in principle, initial steps necessary for increasing the knowledge of the public in specific phases of public health work. If a suitable topic is selected, support of the conference could presumably be obtained for the appointment of a steering committee to develop an appropriate program of action which in time could be translated into an effective project.

It is unwise to attempt to get any wholesale amalgamation of various voluntary agencies. Let each continue to function as effectively as it can. But it would seem feasible to do constructive, coöperative work through the federation type of organization. Several federations—which need not be permanent—could be developed, each to carry out a specific project. One federation might be formed, for instance, to secure wide popular interest in periodic health examination. When that campaign had been reasonably successful, that federation could be dissolved. A second federation dealing with another item might have substantial differences in personnel and sources of financial support. Three or four such federations might be in existence at the same time, each tackling one problem, through coöperative and coordinated work, developed in accordance with sound principles. Such programs along federated or coöperative lines could apparently get financial support. Such beginnings, even in a modest way, would

engender progressively mutual understanding and confidence among the numerous agencies now in the field, and in such a general movement the A. P. H. A. could render real service if it would participate in the initiation of such a program.

POPULAR HEALTH JOURNAL

There is not now being widely distributed to the people of the North American continent authentic information in simple language which would create a harmonious viewpoint on matters of individual and community health. The material at present is technical and smacks of propaganda. Competition among unofficial and professional agencies causes unbalanced and even conflicting reactions on the public.

There is a real demand for a popular priced monthly health magazine, sold on the news-stands. It need not conflict with existing journals. With its management organized along effective lines, embodying principles of federation as above set forth, financial support could doubtless be secured for such a journal for the necessary initial period. The undertaking should be self-supporting in a few years. With expert management, a low subscription rate, and the coöperation of industry, a large circulation should be possible which would attract advertising at high rates.

In the development of such a program, as outlined, the American Public Health Association can serve as a nucleus for a coöperative and coördinated plan.

RELATION TO ORGANIZED MEDICINE

The medical profession plays an important part in matters of the health of the individual, but probably more so in curative than in preventive medicine. Modern medical training is slowly changing this view, and ultimately the community aspects of health work will appear more important than is now the case with many of the older members of the profession. In the meantime, differences of opinion and lack of mutual understanding are unfortunately apparent. It is gratifying to note that the A. P. H. A. is establishing committees to deal with this particularly important phase of future public health activity.

It will be wise for public health agencies of all types to take the medical profession into their confidence, to encourage the teaching of the principles of public health in medical schools, and to interfere as little as practicable with the private practitioner, in carrying forward modern public health work. Physicians have had some cause for fault

finding in the past, and it is to be hoped that a spirit of friendly and effective coöperation, as well as a program of mutual benefit, may ultimately result from discussion. This cannot be done on any wholesale basis; but conferences of fair minded representatives can progressively take up one phase at a time, and arrive at mutually satisfactory conclusions. Surely it is to the advantage of no one to have such antagonisms continue. The A. P. H. A. should be able to create gradually a better understanding between the practicing physicians and those related to their work from the standpoint of public health control.

SUMMARY

This address is intended to emphasize the need for setting up principles of procedure for a more efficient control of public health activities, particularly as these relate to service rendered to health officers and others of the A. P. H. A. The principal items stressed are as follows:

1. Reorganize the A. P. H. A. to bring about stabilization of administration; clarification of the authority and the allocation of responsibility of its officers; and the establishment of better methods of financing and program making; with the continuance of the excellent work of the Committee on Administrative Practice.

2. Lessen the overlapping of efforts by voluntary health agencies, by securing support for specific undertakings recommended by the health officers' group.

3. Provide an effective and scientific organ with popular appeal for expression on problems of today that affect public health.

4. Endeavor to promote better relations between medical practitioners and public health workers.

5. Strengthen the position of the A. P. H. A. in matters of research and standards and, after giving due consideration to various problems, concentrate upon the most timely and necessary ones, with a view to developing them into specific projects. Secure more adequate financial support for such undertakings from sources that will not compromise our independence, self-respect or dignity.

6. Put the responsibility on the administrative health officers for strengthening their strictly professional activities in this Association, giving them ample opportunity to develop and exercise leadership in the affairs of A. P. H. A.; for concentrating on topics that are most helpful and valuable to them and to their communities; and then expect of them the full discharge of their responsibilities.

The Sewage Disposal Problem of Minneapolis and St. Paul*

J. A. CHILDS

Chief Engineer and Secretary, Metropolitan Drainage Commission, St. Paul, Minn.

IN order to understand clearly the sewage disposal problem which now confronts the Twin Cities it is necessary to know something of the history of the Mississippi River, as well as its physical condition, and to see how changes wrought by man have affected this problem.

The Mississippi River has its source in the numerous lakes in northern Minnesota. It flows in a southerly direction a distance of nearly 2,500 miles to the Gulf of Mexico and it has a total drainage area of nearly 1,240,000 square miles.

Since the first settlers entered the country, the river has been a very faithful servant. It was the first trade artery for the early traders and trappers. For many years steamboats on the river carried considerable commerce and made possible the early settlement of the Northwest. The river also has been used extensively as a means of cheap transportation of logs to the saw mills, and at one time supported extensive and profitable clamming industries. Many of the early settlements including Minneapolis and St. Paul owed their existence to the river and the facilities afforded by it. Though to a large extent that faster means of conveyance, the railroad, has taken the place of the river as a means of transportation, the river has been put to work in other ways. It now furnishes a great amount of power for domestic and industrial uses, and is the principal source of water supply for both Minneapolis and St. Paul as well as for about 20 municipalities in Iowa, Illinois, and Missouri. The river has received for many years, and is now receiving—for the most part in an untreated state—the sewage and industrial wastes of the cities along its course.

Before the advent of the white man the 500-mile stretch of river from its source to St. Paul was for the most part a rapidly flowing stream with a total drop of about 750 feet. The 100-mile stretch

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

above Minneapolis has an average fall of over 3 feet per mile. The construction of power dams has changed a portion of this stretch from a rapidly flowing stream to a series of quiescent pools, altering the natural conditions, particularly as regards ice coverage and surface aeration.

RIVER FLUCTUATIONS AND OXYGEN CONTENT

The ability of a river to receive and assimilate waste matter satisfactorily is dependent upon several important factors, among which are volume of flow, and the dissolved oxygen content. The discharge of the Mississippi fluctuates widely, the recorded average monthly flows at St. Paul ranging from 1,300 cubic feet to nearly 60,000 cubic feet per second. The dissolved oxygen content of the river entering Minneapolis also ranges from about 6 to nearly 14 p.p.m. The period of minimum oxygen content (about 6 p.p.m.) occurs twice a year, usually in February and in July. The low oxygen content in winter is caused by ice coverage which prevents surface aeration; the low oxygen content in midsummer is largely the result of decomposition of organic material which takes place more rapidly at higher temperatures. When the time of minimum dissolved oxygen content coincides with a low river discharge, which is often true, a critical condition is created.

Thus there are likely to be two critical periods, one occurring during the latter part of the winter, the other in midsummer, both of which must be considered in determining the degree of sewage treatment necessary. It is during the critical winter period that fish life in Lake Pepin, about 45 miles below St. Paul, is most seriously affected. It is during the critical summer season that nuisances are most likely to exist.

TWIN CITY LOCK AND DAM

A dam known as the Twin City Lock and Dam was constructed in the river between Minneapolis and St. Paul in 1917. This dam is about 33 feet in height, and has formed a pool of relatively quiet water about 5 miles in length, extending up stream to the Washington Avenue bridge in Minneapolis. All but one of the sewers of Minneapolis, and several of those of St. Paul discharge into the river above the dam.

Prior to the construction of the Twin City Lock and Dam in 1917, the sewage was swept away by the rapid current, so that the effect of pollution was not particularly apparent in the immediate vicinity of the Twin Cities. The construction of this dam has, however, so retarded the current of the river as to permit the deposit of large quantities of sludge on its bed in the pool above the dam. Soundings

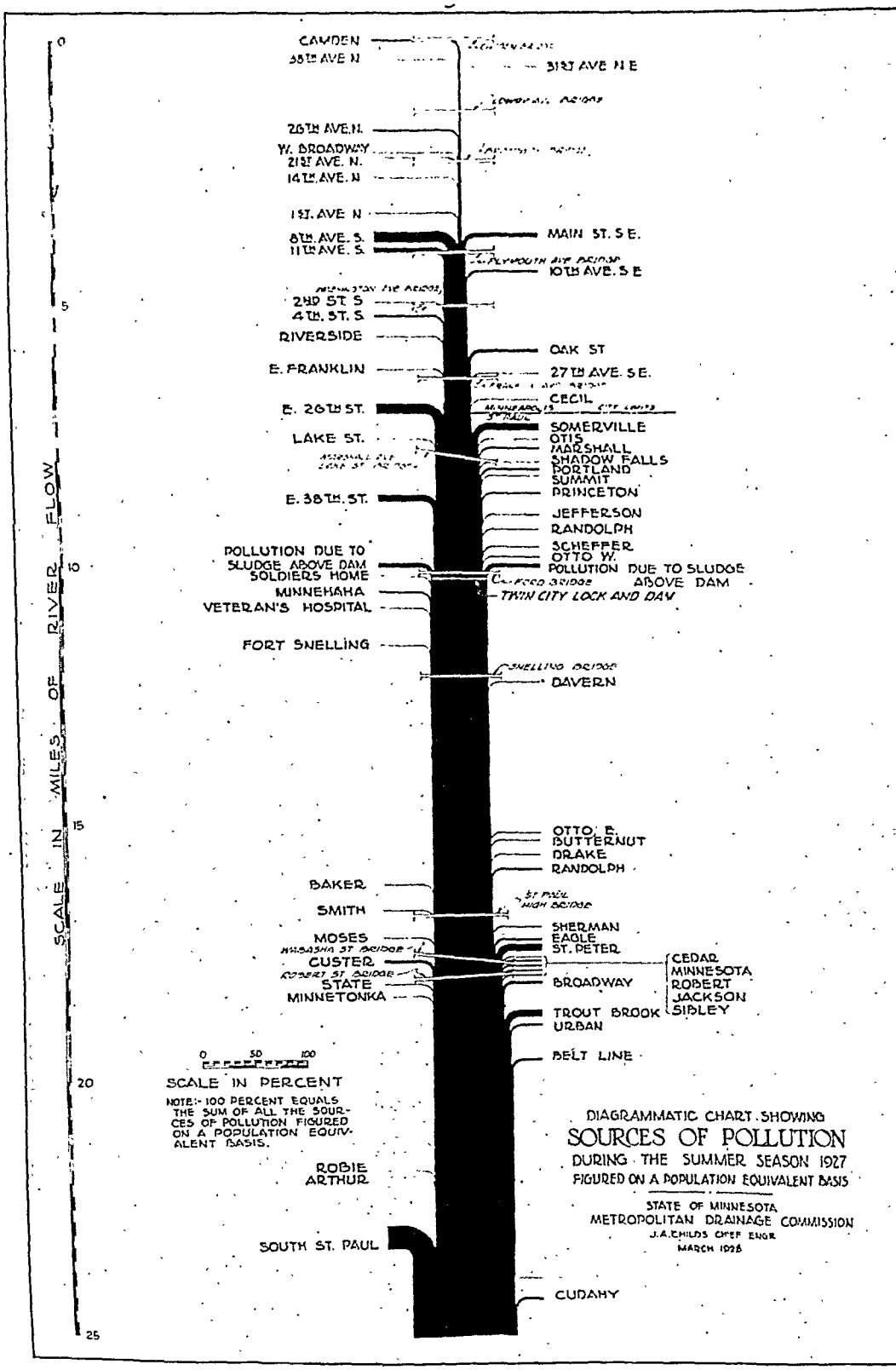


FIGURE I—Sources of Pollution Entering River. Each horizontal line represents a sewer outlet, the weight of the line indicating the per cent of the total pollution in terms of population equivalent contributed by that particular outlet. The width of the vertical line at any point is proportional to the total amount of pollution entering the river in this area above that point.

made in 1928 indicated that about 3,000,000 cubic yards of sludge and silt have been deposited in this pool. The sludge which is deposited during the winter decomposes very slowly until early summer when the higher temperatures stimulate active decomposition as evidenced by rising gas bubbles, odors, and floating masses of sludge.

THE HASTINGS DAM

A new dam is being constructed below St. Paul at Hastings. This dam will create a second pool of relatively quiet water about 30 miles in length extending upstream to the Twin City Lock and Dam. Into this pool will be discharged a large part of the sewage from St. Paul, and all of the packing plant wastes from South St. Paul and Newport. Though the total present sewered population in the Metropolitan Area was estimated in 1927 to have been about 685,000, the industrial wastes have so increased the pollution that its effect was that of the domestic sewage from a population of nearly double that amount, or about 1,300,000. Such, then, is a general survey of the problem confronting the Twin Cities.

SANITARY SURVEY BY U. S. PUBLIC HEALTH SERVICE

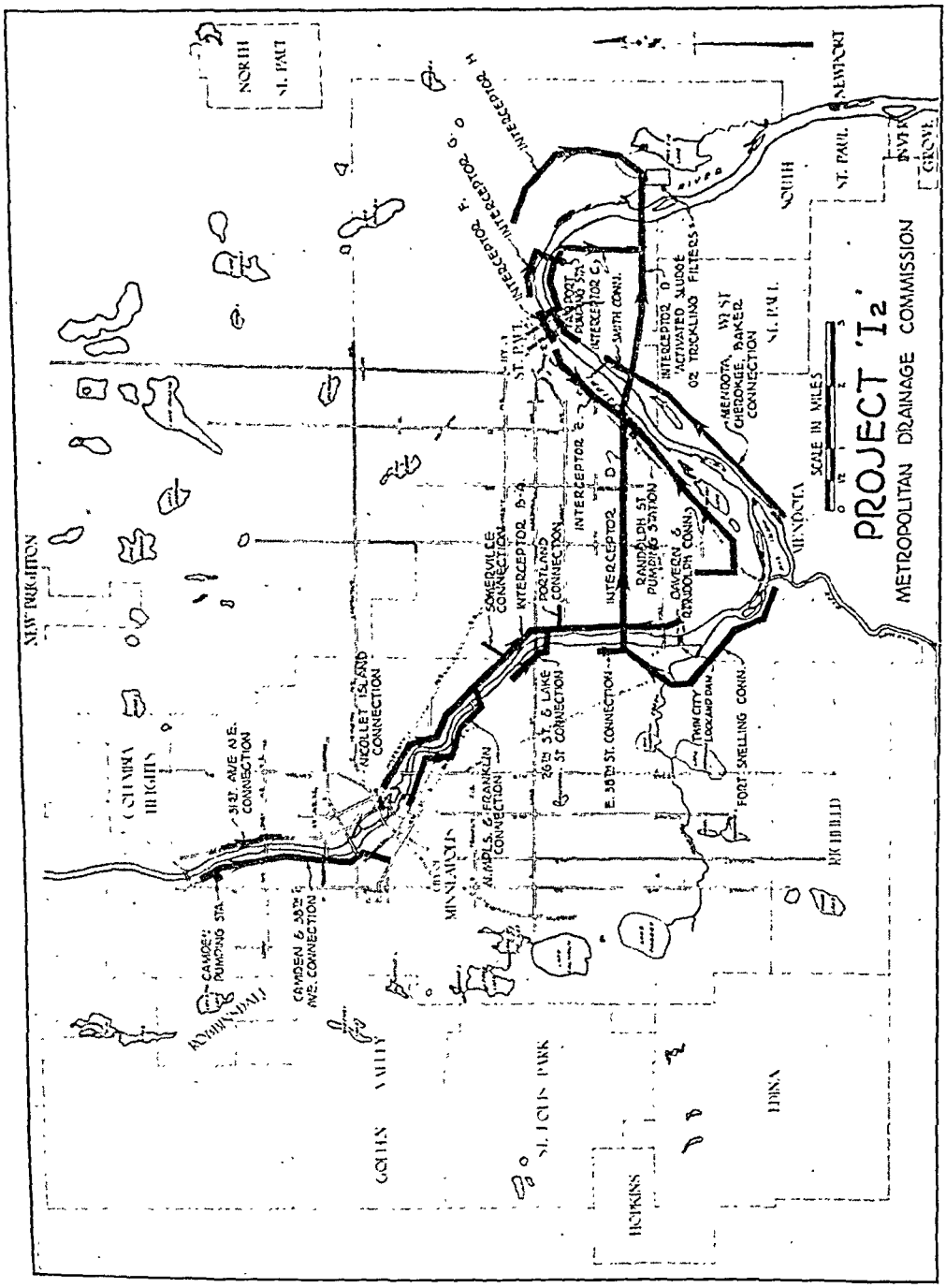
The first official notice of this polluted condition was contained in letters to the city councils of Minneapolis and St. Paul from A. J. Chesley, M.D., Executive Officer of the Minnesota State Board of Health, in July, 1923. Through the interest and financial assistance of the cities of Minneapolis and St. Paul, the Minnesota Commissioner of Game and Fish, the Minnesota Department of Health, and of the Wisconsin Conservation Commission, sufficient funds were raised so that an investigation of the pollution of the river could be undertaken. This investigation was begun in June, 1926, and continued until September, 1927, under the direction of H. R. Crohurst, Sanitary Engineer of the U. S. Public Health Service.

METROPOLITAN DRAINAGE COMMISSION

The act creating the present Metropolitan Drainage Commission was passed by the 1927 legislature. The commission was organized and work actually begun in October of that year and has continued to the present time.

The Commission has received the most hearty coöperation of the Minnesota Department of Health, particularly in connection with the continuation of the stream pollution studies begun by the U. S. Public Health Service.

Among the various phases of the problem studied by the commission are: population, areas, water supplies, existing sewerage sys-


PROJECT 'I2'
METROPOLITAN DRAINAGE COMMISSION
SCALE IN MILES
NORTH ST. PAUL
NEW BRIGHTON
COLUMBIA HEIGHTS
MINNEAPOLIS
ST. LOUIS PARK
HOPKINS
EDINA
MENDOTA
SOUTH ST. PAUL
NEWPORT
INTERCEPTOR H
INTERCEPTOR F
INTERCEPTOR D
INTERCEPTOR C
INTERCEPTOR B-2
INTERCEPTOR E-2
INTERCEPTOR I
INTERCEPTOR G
INTERCEPTOR D
ACTIVATED SLUDGE OR TRICKLING FILTERS
MENDOTA, WEST CHEROKEE, BAKER CONNECTION
RANDOLPH ST. PUMPING STATION
DAVERN & RANDOLPH CONN.
SOMERVILLE CONNECTION
PORTLAND CONNECTION
26TH ST. & LAKE ST. CONNECTION
E. 38TH ST. CONNECTION
NICOLLET ISLAND CONNECTION
31ST AVE. N.E. CONNECTION
CAMDEN & 35TH AVE. CONNECTION
CAMDEN PUMPING STA.
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tems, sewage quantities, sewage characteristics, industrial wastes, extent of treatment required, suitability of plant sites, projects, costs, and construction programs. A statement of the findings of the commission is contained in its 1928 report. Space permits only the briefest summary.

Population—A population census was estimated by sewer districts. This census indicated a total population in 1927 of about 775,000 in the area, of which about 720,000 live within the corporate limits of Minneapolis and St. Paul, and about 685,000 in areas provided with sewers. It is estimated that the population of this area will be about 1,450,000 by the year 1970.

Area—Of about 65,000 acres within the present corporate limits of Minneapolis and St. Paul not including parks and play grounds, about 40,000 acres, or 62.5 per cent, are sewered. It is estimated that a total of about 94,000 acres will be sewered by 1970. It is interesting to note that the population density is at present rather low when compared with many cities, that in Minneapolis being 14.2 per acre and in St. Paul 8.4 per acre.

Water Supplies—These studies included quantities from both public and private sources; hourly, daily, and seasonal fluctuations; and an analysis of the quantities used for domestic, and for commercial and industrial purposes. The total daily consumption was found to be about 100,000,000 gallons.

The Sewerage Systems—The systems of Minneapolis and St. Paul are, with few exceptions, of the combined type, comprising in 1927 a total of over 1,100 miles of pipe. Including the private sewers of the packing plants at South St. Paul and Newport, there is a total of 80 major outlets.

Sewage Quantities—During the winter of 1927 and 1928 weir measurements of sewage flow were made on practically all of the sewer outlets of Minneapolis and St. Paul, South St. Paul, and Newport. The measurements were made at hourly intervals. The total dry weather discharge sewage including waste and ground water was estimated to be about 110 m.g.d.

Sewage Characteristics—Samples of sewage were collected hourly at the same time that the weir gauges were read. Composite 24-hour samples were made from the hourly samples in proportion to the flow at the time of collection. Thus each composite sample represented an average of the entire flow of sewage from the 24-hour period. These samples were subjected to routine laboratory tests such as, the 5-day biochemical oxygen demand, suspended matter, pH values, temperature, and bacteriological examination.

The population equivalents computed from the sewage quantities and the oxygen demand data have been tabulated in such a way that these population equivalents could be compared with the estimated sewered population of the districts. Only a few of the districts may be said to be reasonably free from industries. In most of these districts the population equivalent as calculated from the analytical data was found to be nearly the same as the estimated sewered population. The population equivalent exceeds in many instances the estimated population of the district, because of presence of industrial wastes.

The cumulative pollution is shown in graphic form by Figure I in which each horizontal line represents a sewer outlet, the width of the line representing the proportionate pollution in population equivalent contributed by the sewer outlet which it represents.

Extent of Treatment Required—As previously stated, there are two critical periods which must be considered. It is estimated that complete treatment of the sewage will not be required even by 1970, although treatment somewhat in addition to that effected by clarification will probably be necessary at an early date. The first and most essential step is the construction of intercepting sewers and settling tanks by means of which the major portion of the sewage can be collected and treated by sedimentation. This simple treatment will to a large extent prevent the formation of sludge deposits and will go a long way toward producing the desired results.

PROJECTS

Over twenty projects have been studied and compared. One of the desirable projects is known as I_2, Figure II, which provides for the collection and removal of the sewage from both cities to the Pig's Eye Lake district for treatment and disposal. Though costing more to construct than some of the others, this one will effect the most thorough cleaning up of the river pollution through the Twin Cities, and will place the treatment plant on a large tract of relatively isolated land where ample area for expansion is available.

The cost estimates indicate that about 85 per cent of the sewage of the Twin Cities can be collected and subjected to a clarifying process for an initial construction cost of about $12,000,000 if project I–2 is adopted. No final decision relative to a secondary treatment has been made at this time, although both the activated sludge and trickling filter processes are being considered.

DISCUSSION

C. F. KEYES

Chairman, Metropolitan Drainage Commission, Minneapolis, Minn.

THE outline of the technical phases of the problem confronting the Twin Cities as presented by Mr. Childs is only one phase. The Metropolitan Drainage Commission was created for the purpose of studying this sewage disposal situation, and of reporting how it might best be handled. The commission is simply a study organization without authority to let contracts or do construction work.

Lying immediately outside the corporate limits of Minneapolis and St. Paul are several smaller cities and villages, some of which already have sewerage systems discharging into and using the sewers of Minneapolis and St. Paul as a means of disposing of their sewage and wastes. It is obvious that any scheme which might be adopted should be comprehensive enough to serve the future needs of these outlying municipalities as well as those of Minneapolis and St. Paul. The area actually studied by the commission includes 17 smaller villages and cities and 9 townships located in 5 counties, with a gross acreage about double that of the present area of the Twin Cities.

To the south of St. Paul are the municipalities of South St. Paul and Newport in which large packing plants are located. These packing industries contribute about one-tenth of the total volume of sewage and waste from the entire area, and because this waste is strong, it constitutes about one-fourth of the total pollution. The river cannot be restored to a satisfactory condition without reducing the polluting effect of this waste. This waste may be treated separately or included with the sewage from the Twin Cities. A decision as to ultimate disposal of this waste is not required at this time, since no change in the design of the main intercepting sewers would be required if this waste should later be included with the sewage from the Twin Cities.

It seems advisable for many reasons that Minneapolis and St. Paul should unite for the purpose of carrying out a unified program of sewage disposal. Although public sentiment is generally agreed as to the necessity of providing some immediate means of collecting and treating the sewage wastes of the district, differences of opinion have arisen as to the area which should be included in the district; the methods of financing; the apportionment of costs; and the constitution of the governing body to administer the affairs of the district.

After a study of the problem covering more than a year's time, the Metropolitan Drainage Commission came to the conclusion that the most feasible, practicable, and economical method to relieve the local nuisance conditions in the river adjacent to the Twin Cities was to organize a Metropolitan Sanitary District to include the territories of Minneapolis and St. Paul. Such district would constitute a municipal corporation, would be governed by a board of trustees, and would have power to levy taxes, incur indebtedness, and undertake the construction and operation of a sewage disposal system, including intercepting sewers, pumping stations and treatment works. The commission recognized that the organization of such a district would not entirely solve the problem of river pollution in the Twin Cities area, in that it would not take care of the industrial wastes contributed by the packing industries of South St. Paul and Newport; but it was felt that it would be

impracticable at the outset to attempt to include these independent municipalities as an integral part of the district.

A bill was accordingly drafted and introduced in the Minnesota legislature last winter calling for the creation of a Metropolitan Sanitary District as above outlined. This bill contained a carefully worked out plan for apportioning the costs between the cities of Minneapolis and St. Paul on as equitable a basis as possible. In brief, each city was to pay for the intercepting sewers which serve each city separately. Interceptors used jointly by the two cities were to be paid for jointly in proportion to the assessed valuation of the two cities. The cost of treatment works and operation costs were to be apportioned between the cities in accordance with the volume and pollutional content of the sewage contributed by each city. Provision was also made authorizing the Sanitary District to enter into contract with outside municipalities to receive and treat their sewage at cost.

Owing to objections raised to provisions of the bill, it never came to a vote in the legislature. It was the opinion of the St. Paul group that South St. Paul and Newport should be included in the district at the start, and that the entire costs of construction and operation of the sewage disposal system should be distributed over the entire district by uniform tax levy. Inasmuch as the assessed valuation of South St. Paul and Newport is less than 2 per cent of that of the entire area, while the packing industries of these two communities contribute about one-fourth of the total pollution, this would mean that Minneapolis and St. Paul would pay about 98 per cent of the cost of treating the packing plant wastes. This would increase the cost of sewage disposal to the Twin Cities about 20 per cent above what it would be for the treatment of their sewage alone.

While it is true that the packing industries are a benefit to the Twin Cities, especially St. Paul, and to the Northwest, it was the belief of the commission that any method of financing that would compel the cities of Minneapolis and St. Paul to pay practically the entire cost of the packing house wastes could not be justified. The commission further felt that when a Sanitary District for the Twin Cities was in operation, it should be in a position to contract with the packing industries for the treatment of their wastes on a basis that would be fair to these industries without imposing an undue financial burden upon the Twin Cities.

Should the two cities fail to get together on a joint solution of their sewage disposal problem, the only alternative would be for each city to go it alone. This would involve a greater expense to both cities, and would be especially burdensome to St. Paul; for from a financial standpoint St. Paul has more to gain than Minneapolis, if the two cities united for a joint handling and disposal of their sewage wastes, under such a plan as was proposed for the creation of a Metropolitan Sanitary District. In the meantime the commission is continuing its work in order that plans for a project or projects may be advanced as far as possible, and so that there may be no unnecessary delays in beginning construction, irrespective of what plan shall be ultimately adopted to solve the sewage disposal problem of the Twin City area.

The Problem of Sweets for Children*

IN view of the claims now being made in behalf of a larger use of sweets as food, it behooves us to take our bearings anew in the light of all our present-day knowledge of nutrition.

Counting air and water as free, there are five kinds of substances which make up the "food values" which we acquire when we buy food. These are: (1) the proteins, (2) the fats, (3) the carbohydrates, which include the sugars and starches, (4) the mineral elements, and (5) the vitamins.

In general we do not buy these food value substances separately, or as such; we buy *articles of food* such as bread, meat, milk, fruits and vegetables. Such articles as we have just mentioned contain several kinds of substances of food value and so are *many-sided* foods; whereas articles which furnish only one kind of substance of food value, such as some oils and fats and all pure sugars and starches, are *one-sided* foods.

Now a one-sided food is not necessarily to be avoided; but in order that good food habits may be formed and good nutrition insured, we must be careful to keep one-sided foods from encroaching upon the proper place of the many-sided foods—whether in our eating habits or in our food budgets. That is, both in choosing what to eat, and how much of it, as we go along, and in deciding how to divide up the money which we spend for food, we should keep sweets as well as all other one-sided foods quite strictly in their proper place.

That the eating of candy easily lends itself to abuse is a fact which until recently was clearly recognized by nearly everyone. Even those who indulged freely in sweets agreed that it was an indulgence and not an entirely wholesome food habit. But at present there seems to be on foot a concerted attempt to obscure this fact, and not only is the public being "educated" to eat more sweets, but some writers who undoubtedly have ability and influence are advocating the feeding of more sweets to children. Are their arguments sound?

This question gains added significance through the fact that at the very moment this is being written there arrives a newspaper report that, "The International Sugar Experts Commission, now (April 5,

* Report of the Committee on Nutritional Problems, presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

1929) in secret session at Geneva," proposes "the organization of a widespread educational campaign to demonstrate the desirability of more extensive employment of sugar."

To aid us in forming our own judgment as to whether there really is any such "desirability," let us glance briefly at the different types of food materials which make up the bulk of our food budget, and the significance of each to our nutrition.

Breadstuffs and other grain products (rice is to the Oriental what bread is to us) normally make up the largest and cheapest source of calories and of protein. In these two respects they bring us the most food value for the money. But they are not satisfactory sources of the other two great factors in our nutritional need, the mineral elements and the vitamins.

The meat foods ("flesh, fish and fowl") are rich either in protein or fat or both, which together with their flavors and stimulating extractives give them the properties of "satisfying" and of "staying by." These properties make the meat foods popular and account for the fact that they occupy a large place in the food budgets of most people who can afford them (and perhaps also of many people who, properly speaking, cannot). But it is a very important fact, although difficult for many people to accept, that in general (there are a few exceptions in detail) the meat foods show about the same mineral and vitamin deficiencies as do the grains, so that while breads and meats may form pleasing and satisfying combinations, yet *nutritionally* they can never make a properly balanced diet, and least of all for a growing child—even though a hardy explorer may be able to live a long time upon such a diet without showing or feeling any noticeable injury.

Fruits and vegetables vary greatly in their values as sources of proteins and calories, but these two groups of foods may be counted as one in that they are, in general, important sources of some (not all) of the mineral elements and vitamins, of which both the breadstuffs and the meat foods are but poor or uncertain sources. Hence the fruits and vegetables (at least many of them) are entitled to McCollum's designation of "protective foods," since they tend to protect us from the mineral and vitamin deficiencies which we incur if we live too largely upon the breadstuffs and meat foods.

By far the most important of the protective foods is milk, for it is the most efficient (and almost always the most economical) of all foods in making good the mineral and vitamin deficiencies of the breadstuffs and in insuring the all-round adequacy of the dietary. "The dietary should be built around bread and milk," with fruits and vegetables occupying the places of next importance. The milk, vege-

tables and fruits of such a dietary insure good supplies and excellent forms of proteins, mineral elements, and vitamins, while the bread is an economical and wholesome source of the additional calories needed, and of a generous extra allowance of protein for good measure.

Eggs may be said, in general terms, to stand about midway between milk and meat in their nutritional properties. The fact that eggs blend well with many other things, and aid in the attainment of the varied textures desired in cooked foods, gives them a value of their own in cookery and tends to keep them rather expensive for the food value that they furnish, so that in general they are less economical as "protective food" than milk.

Some of the fats are rich sources of fat-soluble vitamins while others are not. The fats as a group constitute a concentrated source of calories (a compact form of fuel for the body); they stay a relatively long time in the stomach, thus delaying the onset of hunger pangs—a property the lack of which in such foods as bread and turnips was found to put a severe strain upon the morale of both soldiers and civilians in Europe during the war; and in addition to their nutritional significance, fats have their special places in the arts of cookery.

What then is the place of the sweets? Like eggs and fats they are esteemed in cookery as means of attaining the flavors and textures desired in many food mixtures and "made dishes"; but we are here chiefly interested in their nutritional significance. Candied fruits, milk chocolate, ice cream, and so on, are sometimes cited as sweets which convey mineral and vitamin values, and this is true to the extent that they contain fruit, milk, or other of the foods which are good sources of mineral elements and vitamins; but the sugar itself contributes nothing to the food value except as a source of calories.

Children normally are active and spend more calories in proportion to their weight than do any but very active adults; but the children are growing at the same time and ought to get liberal supplies of proteins, vitamins, and mineral elements along with their calories, and it is a sobering thought that sugar, as it now comes into commerce, is the most completely devoid of proteins, vitamins, and mineral elements of all the foods which we give our children. From the nutritional standpoint therefore it would seem that sugar should be of all foods the most cautiously used in feeding children, lest it displace too much of the foods which can do what it cannot, in supplying the proteins, vitamins, and mineral elements which children need so urgently and so abundantly for their healthy growth and development.

We sometimes hear of the "natural craving" of children for sweets; but what sweets do we find in nature? Never do we find in

nature either candy or such concentrated and isolated forms of sugar as are found in the grocery and confectioners' shops. In sweet foods as they actually occur in nature, the sweetness is largely a bait which renders more acceptable to the palate the mother's milk, which is undoubtedly the best of all foods for the young, and also the juices of many fruits and vegetables (and even the saps of some trees), which are of added nutritive value to us because of the mineral elements and vitamins which they contain. (If we trace the "natural" function of sweetness still further back we find that the sweet which we meet in honey was before that contained in the nectar of the flower where it served to bait the bee which, in collecting the nectar for his own use, spreads the pollen which serves to reproduce the flowering plant.) Thus sugar is essentially a bait, or in Bunge's words, "not only an aliment but also a condiment, and easily lends itself, as all such things do, to abuse."

The danger of abuse is of more than one kind. Too much sugar may spoil the appetite for other foods of less pronounced flavor but much more pronounced value in nutrition, and it may displace these more important foods in meeting the calorie needs of the body with the result that while the calorie need is fully met there may be a shortage of some essential mineral element or vitamin; a shortage not detected at the time but detrimental to subsequent growth and health.

It is argued that sugar is good for active children because it is a "quick fuel," and the use of sugar by athletes during endurance contests is cited in support of this idea. The idea has some basis, but it is greatly overworked, if not actually perverted. Who would seriously consider a Marathon race as a suitable exercise for a growing child? And who would seriously claim that the concentration of sugar which can be borne by the fully developed and hardy stomach of an athlete would be equally well suited to the still developing stomach of the growing child which always has enough to do to handle the large amount of food which growth requires, without subjecting it to any unnecessary risk of irritation?

Careful study of much that has recently been written in behalf of increased use of such concentrated sweets as candy leaves us with the distinct conviction that such teaching is not sound from the standpoint of the health interests of children.

In our judgment, it is just as true today as it has been for several years past, that the practical lesson to be learned from the newer knowledge of nutrition is the great importance to health (at all ages and especially in childhood) of giving a more prominent place, in our eating habits and in our food budgets, to what McCollum has called

"the protective foods," i.e., to milk, fruit, and some of the vegetables; and that a "more tolerant" attitude toward sweets for children is not justified except in so far as the use of sugar and other sweets may be practically helpful in preserving the protective foods or facilitating their attractive preparation so that children may be induced to live more largely upon them.

A moderate amount of jam may be good for children—its sweetness may appeal to their palates and its fruit content will almost certainly be good for their health. A liberal amount of ice cream may be good—they may like it because of its sweetness and they will almost certainly be benefited by the extra milk and cream which they thus get.

Without multiplying illustrations, it may be said that in general the proper place of sugar in the food supplies and eating habits of children is not in such concentrated forms as candy, nor in the indiscriminate and excessive sweetening of all kinds of foods, but rather as a preservative and flavor to facilitate the introduction into the child's dietary of larger amounts of the fruit and the milk, the importance of which to child health has been increasingly emphasized with each year's progress in our knowledge of nutrition.

H. C. SHERMAN, *Chairman*
C.-E. A. WINSLOW
E. L. FISK
T. P. B. JONES
D. B. JONES

The Inevitable Assurance

IT would be welcome to see a health book published without the inevitable assurance on the cover page that the author is "free from fads, theories," etc., etc. We do not think it is fair for publishers to handicap their authors by such reiterated protestations. Practically every health book that has come to our attention in the last six months has been thus labelled—that the writer plays no fads, that he has no fanatical views, and that what he has to say represents modern scientific judgment, and so on. As a matter of fact, few individual authors can avoid falling into fads because that is a characteristic of human nature.—*How To Live,* Sept., 1929.

Need for Better Occupation Returns on Death Certificates*

T. F. MURPHY, M. D.

Chief Statistician, Division of Vital Statistics, U. S. Bureau of the Census, Washington, D. C.

FOR a number of years the U. S. Bureau of the Census has been devoting a large part of its attention to the promotion of the satisfactory registration of births and deaths. The work has succeeded to the extent that satisfactory laws are on the statute books of all the states, with the exception of South Dakota, which failed at the session of the legislature in February to enact an adequate law.

In two states, New Mexico and Texas, satisfactory laws have been passed, but the registration in these states has not been given an official test to determine whether it is sufficiently complete to admit them to the registration area. This test is now being made in New Mexico. At the present time, approximately 95.5 per cent of the population of the United States is included in the death registration area, and 94.5 per cent in the birth registration area. While the promotion of registration has been given a great deal of attention by the Division of Vital Statistics, we have always kept in mind not only the desirability, but the almost absolute necessity of procuring more accurate returns. This phase of our work has been carried on for so many years that we consider it a part of our routine labors.

Each year industry grows increasingly more complex and the necessity for safeguarding the health of the workers becomes more urgent and of greater interest. A very large number of the great industrial plants of the present day have well organized health services whose aim it is to prevent accidents, to cure minor ills, to provide recreation, and to use means to build up and preserve the health of their employees. These services are usually supervised by physicians, professional nurses, and trained physical directors. Comprehensive campaigns are carried on urging annual physical examinations for workers; and the better understanding of the value of health gained is to the mutual benefit of the employee and the employer.

In many states employers of labor are required to take out acci-

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dent and mortality insurance for their employees. This requirement is a powerful factor in improving the health and the conditions under which the employees work. The 1930 population schedule, as usual, will include inquiries relative to occupation. These furnish the foundation for determining the mortality in any particular line of work. The Bureau is now revising the index of occupations so that it will be possible to edit the occupational returns received on the population schedule, and the mortality returns on the same basis.

The demand for occupational mortality statistics has reached such proportions that the U. S. Bureau of the Census has felt that this part of the standard certificate should be enlarged, and that definite information of this character should be secured. Consequently, the Bureau and the Committee on Forms and Methods of Statistical Practice of the American Public Health Association prepared the revised standard certificate of death. This form was adopted by this Association through the Vital Statistics Section in October, 1928, in Chicago; and by the Conference of State and Provincial Health Authorities of North America on May 31, 1929, in Washington. Early in 1930, the federal government will take a decennial census of population, and as a result we shall have definite data relative to the 120,000,000 or more inhabitants of our country.

The committee on the revision of the International List of Causes of Death will meet in Paris this October. Taking all of the above facts into consideration it would appear that now is the ideal time to put into use the standard certificates so that the data will be comparable with the material gathered on the population schedules.

Everyone realizes that certain occupations are more hazardous than others. Employees in industries in which dust is a great factor, those exposed to exceedingly hot or cold temperatures, excessive moisture, poisonous vapors, and explosive compounds, are among the workers whose occupations are more hazardous than the average. Granted that a certain occupation is hazardous, the question arises, how hazardous is it? As a matter of fact, how much more dangerous is it than other occupations in the same industry or in other industries?

Occupation is without doubt one of the determining factors in a death rate. In reality, it is a double factor made up partly of the direct hazards of the occupation, and partly of the living conditions pertaining to the occupation which affect both the worker and his family. The presentation of adequate statistics of death, classified according to the occupation of the decedent, should therefore form a part of any comprehensive program for vital statistics. In order that the results may be of the greatest value, it is necessary that the

returns received on our transcripts conform as nearly as possible to the standard list of occupations used for the population census.

Some indication of relative occupational hazard is afforded by the mortality statistics compiled by occupations for the industrial policy holders of certain large life insurance companies; but no mortality statistics have ever been available in this country to give this information on a large scale. The U. S. Bureau of the Census has published no occupational mortality statistics since 1909, although some data were compiled for 1920. Considerable information is available in some of the states with reference to the number of deaths from accident or from disease which may be directly traceable to the workers' occupations. Such data are usually kept by the state department of labor or by the state workmen's compensation commission, but those deaths of workers in which the relation of employment to the cause of death is more or less uniform are seldom recorded. As an illustration, there has long been an idea that persons in certain lines of employment, such as locomotive engineers, were especially liable to die from affections of the kidney. The truth of this contention could be determined by death rates for such occupations.

For the computation of death rates for occupational groups, two kinds of material are needed—deaths classified according to the occupation of the decedent, and population data classified in the same way to form the basis for the rates. It is further necessary that the occupation classification of these two factors, so far as possible, be made on the same basis.

One of the principal difficulties in the way of compiling satisfactory mortality statistics by occupations is that of procuring an accurate return on the death certificate of the occupation followed by the deceased. A recent examination of more than 1,500 certificates selected from representative areas showed that only about 70 per cent contained occupation returns sufficiently complete to afford a basis for satisfactory classification. While information as to the industry is not absolutely required in all cases, it is essential to the accurate classification of a very large number of occupations, and there seems to be no way of assuring its presence when it is needed except to insist on accurate answers to all questions relating to occupation on the death certificates in accordance with instructions.

While the occupational data on the general census schedule are not all complete and satisfactory, the proportion of unsatisfactory returns is very much less than the 30 per cent shown for the death certificates. The reverse ought to be true. For the decennial census, the Bureau must appoint over 100,000 enumerators, who, in their

house-to-house canvass, are required to obtain from the housewife, or some other one, information concerning the 26 or more inquiries for each person on the population schedule.

The information on the certificate of death is usually obtained from a member of the family. As a general proposition, the undertaker, physician, or other person who gathers the information for the certificate of death, is more intelligent and should be more accurate than the average census enumerator. Furthermore, he is recording information with regard to occupations almost daily and not, as in the case of the enumerator, once in 10 years. The objection made in some quarters that this occupation query places a greater burden upon the undertaker or physician does not seem to me to be reasonable.

I have had experience in collecting many thousands of schedules relating to many different lines of industries and, as a result of this experience, I feel that one or two more intelligent questions would be all that would be necessary to obtain more correct data of occupations than the Bureau has been receiving. As an illustration, an examination of the returns made in one area shows that 88 transcripts were received for engineers, and on 54 of this number the occupation was given as stationary engineer—a very definite and satisfactory return. The remaining 34 simply had "engineer" and the Bureau could not, of course, classify them because we were unable to determine whether they were civil, steam, stationary, locomotive, metallurgical, sanitary, or any one of a number of other divisions in that line of work. How simple it would have been to have said "locomotive engineer," "civil engineer," etc.

A hurried examination of a large number of the returns shows that a word or two would be all that would be necessary to place approximately one-half of the unsatisfactory returns in the satisfactory class. As another illustration, we have hundreds of returns with "mill operator" as the occupation. Why not add or substitute "weaver," "spinner," "cotton mill," "stationary fireman," or other descriptive title. It is not at all necessary that a scientific or technical nomenclature should be adopted in order to furnish the Bureau with the information it desires. Simple terms are preferred. If the undertaker will answer the inquiries clearly in one or two words, it will be all that the Bureau requires.

In order that the occupational information may be returned in the same manner on the death certificates as on the population schedule, it is the intention of the Bureau, as soon as we can do so, to print small reference booklets similar to the *Physicians' Pocket Reference* and distribute them rather freely. This booklet in a broad way will

list terms to be avoided, and furnish a number of illustrations of the proper method of answering the inquiries. In this way we hope to place in the hands of all of those who make out death certificates sufficient information to enable them to secure correct answers.

The Bureau does not expect that it will be possible to procure complete occupational returns on all of the mortality certificates during the first, or even the second or third year. It does believe, however, that complete information as to the occupations of decedents is of such definite value that the use of the new certificates should be started generally at the beginning of the coming year. In fact, a number of the states have advised me that they are already using the new certificates or propose to use them next year.

It is needless for me to remind the state and city registration officials that, without their hearty coöperation in obtaining complete certificates, the U. S. Bureau of the Census is powerless to compile statistics of mortality, by occupations, of any value to the public, health officials, or sanitarians. By refusing to issue burial permits, the registrars can insist that all items on the certificates be completed, thus showing undertakers and others the value to the relatives, to the community, and to the state of having accurate and complete certificates. With the assistance of these officials the U. S. Bureau of the Census should be able to present valuable and interesting occupational mortality statistics.

Hygiene

SIR John St. Clair (born 1754) said:

"Knowledge may be compared to a small fraction of gold, dispersed throughout a great quantity of ore. In its rude condition, the strongest man cannot bear its weight or convey it to a distance; but when the pure metal is separated from the dross, even a child may carry it without difficulty."

So he proceeded to refine the existing publications on hygiene and issued his text-book in four volumes in the year 1807. Comparing this early effort with the latest of many successors one is struck by two things—first how little resemblance there is between the laws of health then and now, and secondly how much more concentrated is the essence than it used to be. One cannot claim that hygiene has become more readable. Those careful dissertations, flavoured with an esoteric insight and adorned with lively foot-notes of a narrative kind on, say, the relative merits of ale and beer as a beverage, or the advantages of dining at seven in the evening rather than at six o'clock; it is hard to see them replaced by snappy paragraphs on "The Digestive Tract."—From *The World's Health*, X, 2: 200 (Apr.–June), 1929.

The Health of Anabolic Nutrition*

FRANCIS LOWELL BURNETT, M. D.

Massachusetts General and Peter Bent Brigham Hospitals, Boston, Mass.

FOOD (is) the medicine of health and medicine the food of sickness."[1] "The form and structures of all living organisms are clearly dependent in a large measure upon the quantity and quality of their nutrient. A knowledge of these effects gives a deeper insight into the process of morphogenesis and a means whereby it may be experimentally controlled to a degree hitherto generally unrecognized."[2] The purpose of consuming food is to nourish the body, but on account of the delicate, intricate, and correlated processes of tissue construction and repair, essential or anabolic nutrition is only little by little becoming understood. The action of the vitamins in curing deficiency diseases, the beneficial effects of liver and protein food in blood regeneration, and the reduction of carbohydrate food in restoring the functions of the islands of Langerhans are perhaps phases of anabolic nutrition. On the other hand, when a patient's ways of eating and mode of living are still further taken into account for this kind of assimilation, a subtle cause of disease appears to be revealed, through the means to detect and maintain a state of health.

The essential nutrient substances for the development of this state of health seem to be assimilated only when the aliment passes through the digestive system within the limits of normal absorption. Accordingly, it is detected and maintained by the indexes of absorption. Food in the digestive tract is not in the body, but merely passing through; but when it is adjusted to comply with a final moulding of the intestinal contents, or the presumably normal form of the feces, and also with the time taken by a marked meal to pass through the digestive system, or intestinal rate, some diseased tissue becomes healthy.[3]

To consider nutrition from this point of view, the digestive system must be thought of as a highly perfected nutritive apparatus which was purposely designed for maintaining the integrity of the body. Such a mechanism cannot often be imperfect, and therefore variations

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in its action are due to the food mixtures put into it. When the aliment is complete, properly proportioned, and thoroughly comminuted, it will complete its cycle of digestion and absorption, and apparently supply nutrient substances for the development and maintenance of an improved state of well-being. In this way, the cure of disease and the restoration of health may not be so much a matter of knowing more about disease, as it is of understanding, regulating, and later maintaining anabolic nutrition for the acquisition and control of health.

INTESTINAL INDIGESTION AND DEFICIENCY DISEASES

At present, health is a vague and variable condition, but the gulf that exists between health and a recognized deficiency disease has been conclusively demonstrated.[4] In this dietary experiment, rats given a vitamin poor food were small and weak, and had a lowered vital resistance; yet they were able to reproduce, and did not show obvious signs of disease. The cause of such a condition is evidently due to a failure of nutrient substances to build up the tissues. May not such a deficiency occur in patients from partially incomplete or other food factors? In the treatment of disease, an attempt is made to restore health. Without an understanding of an exact state of health some human diseases are not only very resistant to all kinds of treatment, but if once allayed are very apt to recur. Many of these are supposed to arise from a metabolic disorder, and as such a cause implies a failure of nutrient substances to build up the cells they are virtually deficiency diseases. Malabsorption is frequently an early and pronounced sign in many of them.[5]

With an understanding of the factors that produce an irritable colon, intestinal indigestion, and malabsorption, the care of the human body must be looked upon from a more intelligent point of view, and, instead of allowing malabsorption to progress until the remote effects of damaged tissue make a diagnosis possible, patients must be educated in the ways of right living to keep a check on the indexes of absorption. In this way they must prevent nutrient substances from going through instead of into them, and acquire and maintain the health of anabolic nutrition. Some persons have been educated in the practice of anabolic nutrition, and in this way metabolic or deficiency diseases may have been prevented. For the most part, however, these health measures have been applied to patients and the cure of disease, in order to obtain a more practical knowledge of the value of this treatment.

The vitamins have become established as necessary requirements for normal nutrition. On general principles, eating too fast and too

much, and the consumption of excessive fat, sweet, highly spiced food, and fruit, do not improve nutrition. The constant use of laxatives, oils, or enemas does not strengthen the body. With an understanding of the control exercised by the proximal colon in anabolic nutrition, the accessory as well as these faulty food factors is made subservient to bodily action, and the intestinal contents are entirely moulded into discrete masses that compose and regulate the presumably normal feces and intestinal rate. On the other hand, when these requirements are not generally fulfilled, the colon becomes irritable and intestinal indigestion ensues, as determined by soft and formless feces and a rapid intestinal rate.

THE PRACTICE OF ANABOLIC NUTRITION

In practice, anabolic nutrition is brought about by educating patients how to eat, rest, and exercise according to the action of their own nutritive apparatus. Inquiries into the ways of eating and mode of living of patients with metabolic or deficiency diseases invariably reveal one or more erroneous practices which must be corrected in order to reduce the irritability of the colon and prevent intestinal indigestion.

Patients are educated through the use of diagrams of the digestive system, roentgenograms of the normal and abnormal colon, pictures of the normal and abnormal feces, figures on the intestinal rate, and the record of a person controlling his health. From these illustrations and records they get a preliminary understanding of the subject, but more detailed instruction should be given from an examination of a week's record of their own nutrition. On the record should be entered the food consumed, the time spent at meals, the time and kind of dejection, and a test of the intestinal rate. For this test the patients ingest 25 c.c. of millet seed or 100 gr. of charcoal immediately after an evening meal. Then the hours that elapse from the ingestion to the first and last appearance of the marker in the feces are noted. With patients having one, and sometimes two normal dejections daily, the marker first appears in about 63 and is last seen in about 134 hours.

From these records of nutrition brought in at varying intervals according to the health measures necessary to adjust, anabolic nutrition may be attained and the disease relieved. The care of the person should not end here, however, because anabolic nutrition must be subsequently maintained to prevent a recurrence, and to cure the disease. Some patients readily acquire a knowledge of the food factors and ways of living that influence nutrition and carry out the

principles afterward. Others find exact ways of eating difficult to understand and maintain. Ordinarily, patients should observe the feces daily and know enough to keep them normal by adjustments of diet, etc. As an additional check on anabolic nutrition, they should test the intestinal rate and weigh the body every month, and finally have a health examination once a year. The records of a few patients taught to cure metabolic or deficiency diseases by these principles of treatment follow. A more detailed study of some of them has already been published,[6] while others will appear in due time.

An English Jew, 31 years old, has had psoriasis for 13 years. Recently it has become worse and changed to dermatitis exfoliativa. He has also lost 20 lbs. within the last year (see Figure I). He eats a great deal of food, very rapidly; has 2 or 3 soft dejections daily and sometimes gets diarrhea. He was advised to eat slowly and less food. (19. VI. '22)—Has a fair record but the colon has been irritable, the dejections soft and formless; and the intestinal rate is 13–63 hours. (11. VII. '22)—The patient has followed instructions faithfully, acquired normal dejections in a month after the last visit, and the skin has gradually become normal. The intestinal rate is 74–141 hours, and his weight has increased 15 lbs. (see Figure II). (11. III. '24)—Skin continues healthy. Feces generally normal. No record or rate. (3. I. '28)—Continues to be careful of food, and dejections are generally normal. Skin healthy.



FIGURE I—Illustration of marked malnutrition of a man with a metabolic skin disease.



FIGURE II—The healthy skin of the same man after carrying out the principles of anabolic nutrition for 4 months.

A single man, 39, has had recurrent iritis and indigestion every autumn for 6 years. He had gained 50 lbs. in the last 10 years. He ate rapidly and a great deal of starchy food. Weight, 192 lbs. Had 2 large dejections daily. Was advised to reduce food, especially starchy food. (19. XI. '26)—Dyspepsia somewhat less. Feces continues soft and formless with a rate of 19–43 hours. Still eats too much starchy food. As a moving picture operator, his hours are irregular. Was advised to eat a moderate breakfast at 10 A.M. and a dinner at 4.30 P.M. (21. I. '27)—Had an attack of diarrhea a few weeks ago and had slight inflammation of eye. Rate now 18–89 hours, and weight, 172 lbs. (2. VI. '27)—Eyes continue healthy. Dejections becoming formed; rate 41–90 hours, weight, 162 lbs. (18. XI. '27)—Symptomatic indigestion has entirely disappeared and he feels better than he has for years. Is happy on two meals. Feces formed with rate of 43–90 hours, weight, 166 lbs. (19. IV. '28)—Feels well and eyes have been healthy during the winter. Feces generally formed with a rate of 42–90 hours, weight, 170 lbs. Was advised to eat less. (15. XI. '28)—He gets indigestion at times from too much fruit. Rate 42–96 hours, weight, 162 lbs. (16. V. '29)—Feels well, but gets soft dejections from too much food. Rate 43–97 hours, weight, 168 lbs. Less food advised. (29. VI. '29)—Had another attack of iritis, but it was very mild, and responded to a reduction in food. Feces often normal with rate of 24–120 hours, weight reduced to 155 lbs. (27. VII. '29)—Eye healthy again and he feels unusually well. Dejections entirely normal, with a rate of 72–144 hours, weight, 153 lbs.

A widow 64 years old has had arthritis for 7 years. For the last 3 years it has been so severe she has been unable to work. She has a poor appetite, takes physic regularly, and has lost 15 lbs. in 2 years. Weight, 108 lbs. She was told to eliminate physic, eat fruit for two meals, try regularly to have a dejection an hour after breakfast and again before going to bed, but that her dejections would be irregular for a few weeks. (31. VIII. '27)—Still has pain. Dejections are formed and becoming regular without physic, rate 12–134 hours. (28. IX. '27)—Is beginning to feel stronger and has less pain. Dejections have become regular with a rate of 20–156 hours. (19. X. '27)—Has been worrying a good deal and has not slept well. Rate 15–134 hours, weight, 103 lbs. (11. I. '28)—Has much less pain and is able to do a great deal more. Feces generally normal with a rate of 36–108 hours, weight, 106 lbs. (28. III. '28)—Is much improved, rate 36–134 hours, weight, 109 lbs. (24. X. '28)—No longer has pain and joints are freely movable, rate 38–156 hours, weight, 112 lbs. (12. IV. '29)—Has had a little indigestion and pains have returned, rate 15–91 hours, weight, 118 lbs. (10. VI. '29)—She had been eating too much fruit the last month, but recently has had good absorption, with a rate of 38–120 hours, and the indigestion and pains in her joints have entirely disappeared. Weight, 118 lbs.

THE ANABOLIC PROCESSES

Verworn states:

The fundamental fact of life is the metabolism of living substance, which is continually and spontaneously undergoing decomposition and building itself up anew with the help of food substances it takes in. Among the organic matters which compose living substance, proteids form the most important part. . . . The proteids and their compounds . . . are . . . stable . . . , whereas the hypothetical combination which lies at the center of organic metabolism is extraordinarily

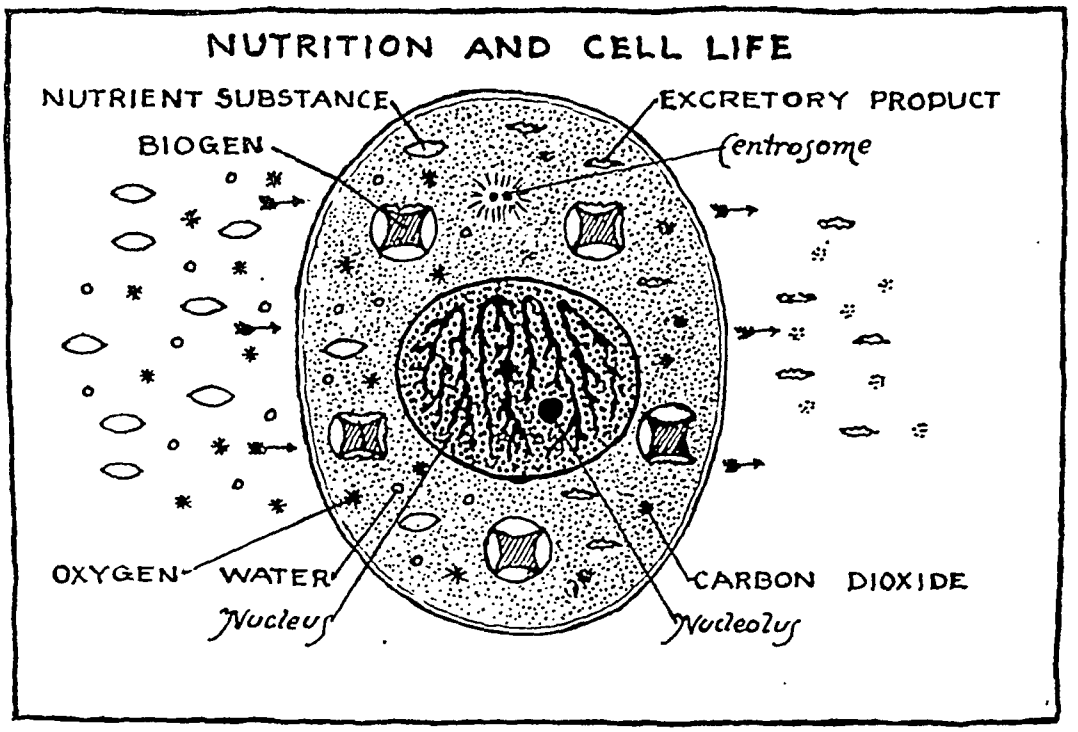


FIGURE III—A diagrammatic illustration of the nutrition of a cell. Nutrient substances, water, and oxygen are seen entering on one side, and excretory products and carbon dioxide are passing out at the other.

labile and continually undergoing spontaneous decomposition. . . . We have to think, therefore, not of ordinary proteids . . . but of still more complicated combinations, the atoms of the molecule of which have a strong tendency to group themselves in new arrangements. Owing to their fundamental importance, these combinations have been termed " biogens." When we come to inquire how such labile biogen molecules are built up out of proteids of food, our knowledge is much restricted. Doubtless the intramolecular addition of inspired oxygen has much to do with it, for living substance deprived of oxygen loses its . . . tendency to decomposition. . . . The decomposition of living substance is always associated with the formation of carbon dioxide. If we accept these views, . . . assimilation is the reformation of biogen molecules by those already existing, aided by food stuffs.[7]

This process is graphically illustrated in Figure III.

Active cells are known to use nutrient substances from the blood; for specimens taken simultaneously from the jugular and mammary veins of a milch cow and analyzed show less sugar and tryptophane in the abdominal vessel,[8,9] thus indicating that these substances were assimilated by the active mammary cells for the formation of milk. The utilization of nutrient substances for the growth of cells in tissue cultures has also been demonstrated.[10]

Young bits of heart, liver, skin, and intestine from chicken embryos grow well in a pure saline fluid, but 11-day tissues require "growth promoting hormones" of a more complex composition.

Serum supplies such a medium, and all tissues grow well through a number of generations. In yeast extract, however, heart muscle alone fails to grow even after the addition of serum, and therefore yeast evidently has an inhibiting effect on the growth of this tissue. After some time liver in serum ceases to form parenchymous, but instead develops less complex fibroblast-like cells. Such a deviation of cellular growth has also been observed in scorbutic guinea pigs.[11] With a complete food, sections of the teeth show an orderly array of the odontoblast layer closely applied to the dentin. In early scurvy, this layer becomes separated, the cells shrunken, and irregular calcium deposits form; but the principal substance is a gelatinous material which is supposed to be a defective product of the odontoblasts. Accordingly, when these highly specialized cells do not receive normal nutrient substances, they exhibit a perversion of function and a dystrophic growth.

A contrast in the gross appearance of deficient and normal bone may be seen in the jaw of a guinea pig shown in Figure IV. This is one of a group which in early life was fed a scorbutic diet, and developed the poor, decalcified material shown in the anterior portion. Before the deficiency disease became too extreme, the animals were given a complete food, and the strong normal bone, seen growing over the other, formed.

From the improved nutrition brought about in patients with psoriasis, iritis, and arthritis, it is evident that nutrient substances



FIGURE IV—The jaw bone of a guinea pig showing the development of a poor, decalcified bone, in the anterior portion, from a scorbutic diet, and strong, normal bone, in the posterior part, from a complete food. (The illustration is used through the kindness of Dr. Percy R. Howe of Boston.)

must have been assimilated by the cells of the skin, eyes, or joints to relieve them of a deficient condition and restore them to health.

The adjustment of a patient's ways of eating and mode of living to acquire this state of health has been brought about by recognizing the digestive system as a highly perfected nutritive apparatus, in which there is a mechanism that controls anabolic nutrition. This is a mechanism by which a secondary digestive pouch is formed of the proximal colon by pulsating constriction rings. In this pouch, nutritive material is kneaded back and forth until a certain kind of absorption occurs, and then the rings mould the intestinal contents into discrete masses that compose the normal feces. This action of the proximal colon has long been known to be normal in many vertebrates.[12] The action is so complex, and so delicately adjusted, that the requirements necessary to bring it about have not been generally observed in man, because the food must be complete, thoroughly comminuted, and properly proportioned.

Rest and exercise also appear to influence this function. Thus the proximal colon serves as an exact, automatic, and sensitive control of the absorption, which is evidently nicely correlated with digestion and assimilation, and regulates the nutrient substances the tissues receive from the food in anabolic nutrition. By the acquisition and subsequent control of this kind of nutrition, a heretofore unrecognized state of health is evidently acquired and maintained, which seems essential for the prevention or cure of some metabolic or deficiency diseases.

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Essential Features in the Design of Sanitary Drinking Fountains*

THE Committee on Plumbing of the American Public Health Association has had insufficient time to prepare a detailed final report upon the subject of the Design of Sanitary Drinking Fountains, as a thorough study of this subject would require circularization of the manufacturers, schools, and public health authorities, to secure comprehensive information as to the nation-wide aspect of the subject. It is desired at this time, however, to present a progress report.

There appears to be a lack of appreciation of the sanitary significance of certain features of the design of drinking fountains, because frequently improperly designed units are installed in schools, railroad stations, and other public places, where in most cases the equipment has been carefully studied before selection. The possibility of infectious diseases of the respiratory tract being transmitted by the use of insanitary drinking fountains has been demonstrated. A vertical jet fountain with an exposed nozzle may be likened to a common drinking cup, which has been condemned by practically all public health agencies. At present, therefore, it appears that both sanitary and insanitary fountains are available to the public; that a public health problem exists; and that apparently on the part of public health authorities there is a lack of appreciation of the necessity for controlling and supervising such fountains. It is very appropriate that the American Public Health Association use its influence in bringing the essential features in the design, construction and operation of sanitary drinking fountains to the attention of its members, the manufacturers of such equipment, and the public.

A committee of the American Water Works Association, similar to this, reported on this subject in 1924 and concluded as follows:

1. All types of drinking fountains with vertical jets are to be condemned.
2. Most types of drinking fountains with slanting jets are to be condemned.
3. To be sanitary, drinking fountains should conform to the following specifications:
   a. The jets shall be slanting.
   b. The orifices of the jets shall be protected in such a manner that they cannot be touched by fingers or lips, or be contaminated by droppings from the mouth, or by splashings from basins beneath the orifices.

* Report of the Committee on Plumbing, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

c. The guards of the orifices shall be so made that infectious material from the mouth cannot be deposited upon them.

d. All fountains shall be so designed that their proper use is self-evident.

Section 61 of the Railroad Sanitary Code of the U. S. Public Health Service reads as follows:

If drinking fountains of the bubbling type are provided in any railway station, they shall be so made that the drinking is from a free jet projected at an angle to the vertical and not from a jet that is projected vertically or that flows through a filled cup or bowl.

It will be noted that this portion of the railroad sanitary code conforms with the above mentioned conclusions.

Careful consideration by the committee of the requirements in the design, construction and operation of drinking fountains whereby such structures may be in reality sanitary, indicates that the following details should be considered.

1. The fountain should be constructed of impervious material, such as vitreous china, porcelain, enameled cast iron, other metals, or stoneware.

2. The jet of the fountains should issue from a nozzle of non-oxidizing, impervious material set at an angle from the vertical, and at an elevation above the edge of the bowl, so that the end of the nozzle will not be flooded in case a drain from the bowl of the fountain becomes clogged.

3. The end of the nozzle should be protected by non-oxidizing guards to prevent the mouth or nose of persons using the fountain from coming into contact with the nozzle.

4. The inclined jet of water issuing from the nozzle should not touch the guard, thereby causing splattering.

5. The bowl of the fountain should be so designed and proportioned as to be free from corners which would be difficult to clean or which would collect dirt.

6. The bowl should be so proportioned as to prevent unnecessary splashing at a point where the jet falls into the bowl. Self-cleansing anti-splash rims are recommended.

7. The drain from the fountain should be connected to a separate waste pipe.

8. The water supply pipe should be provided with an adjustable valve fitted with a loose key or an automatic valve permitting the regulation of the rate of flow of water to the fountain so that the valve manipulated by the users of the fountain will merely turn the water on or off.

9. The control valve should be operated preferably by knee or foot action to avoid possible hand contamination.

10. The height of the fountain at the drinking level should be such as to be most convenient to persons utilizing the fountain. The provision of several step-like elevations to the floor at fountains will permit children of various ages utilizing the fountain. Elevations may be difficult to provide, however, at fountains recessed in walls.

11. The rate of flow and the pressure should be such that the water will not splash over the bowl. It should be at a rate not less than ½ gallon per minute and at nozzle pressure not exceeding 5 pounds per square inch.

12. The waste opening and pipe should be of sufficient size to carry off the water promptly. The opening should be provided with a strainer.

Obviously, the control and supervision of public drinking fountains should be delegated to local health authorities. It is the committee's impression, however, that few local ordinances on this subject have been promulgated. In certain instances, however, boards of education have specified in their building standards what types of drinking fountains must be installed in approved school buildings. It is felt, therefore, that this committee might well prepare specifications for sanitary drinking fountains for the guidance of members of this Association.

The conclusions of the committee of the American Water Works Association given above indicate that the essential features of sanitary drinking fountains are sloping jets which are so located as to be above the level of the water draining from the bowls. Many of the so-called sanitary drinking fountains available at present do not fulfil these requirements. In fact, the vertical jet type fountain seems to be the most popular. It is necessary, therefore, that publicity be given to the essential features of design of these fixtures.

The use of sanitary drinking fountains involves several secondary problems, such as location, water supply, and cooling. It would seem a relatively simple matter to locate drinking fountains properly, and yet such fountains have been observed in toilet rooms, vestibules, baggage rooms, and isolated in improperly lighted hallways. It is not felt that the mere location of a drinking fountain is of great sanitary significance; yet it is apparent that the education of the public in matters of cleanliness and hygiene will be hindered by the inference drawn from observing such structures in toilet rooms or similar locations. Esthetic considerations must be considered likewise.

It goes without saying that the water obtainable through drinking fountains should be of satisfactory sanitary quality. The pressure of the supply is also of considerable importance, because if the pressure is insufficient the rate of flow of the water is too slow to produce the desired size jet, making it difficult to secure water. This deficiency may be caused by undue resistance to the flow of water by the jet and control valve of the structure, or to low pressure on the distribution system. If the pressure is too high, the jet is too strong and water is splashed over those using the fountain. If, on the other hand, the pressure is insufficient, the jet may not reach the proper height and there will be a tendency for those desiring water, especially children, to secure it by placing their hands or small utensils in the bowl of the fountain. Frequently valves are provided on fountains for adjusting

the rates of flow, to provide the desired size jet. Automatic pressure control valves are preferable, if not necessary, with slanting jet fountains, as the pressure of the water supply varies throughout the day.

Drinking fountains are also subject to the limitation imposed by the necessity of cooling a relatively large volume of water, because warm water is not attractive to the public. The quantity of water flowing through a drinking fountain is much in excess of that which would be used were individual drinking cups available, so obviously the amount of ice necessary to cool the water issuing from drinking fountains is greater than otherwise would be the case. It is felt that this feature is one of the salient reasons why drinking fountains are not so popular with the public as they were expected to be by those interested in providing sanitary means of securing potable water. Mechanical refrigerating equipment is available, however, for cooling the water. The cost of such installations is about twice that of equipment for cooling with ice. Many of these units, therefore, are being installed. Sulphur dioxide and other gases are being used as the refrigerating agents.

It should be emphasized that the design of this equipment should be such that the gas will not enter the water supply of fountains in case of leaks; otherwise sulphurous acid or other compounds would be formed in the water. Obviously, the fountains and refrigerating equipment should be designed and installed in such a manner that cross connections are not formed between the water supply and drainage systems.

C. A. HOLMQUIST, *Chairman*
A. E. HANSEN
W. C. GROENIGER
F. R. KING
H. E. BABBITT

DISCUSSION

H. A. WHITTAKER

Director, Division of Sanitation, Minnesota Department of Health, Minneapolis, Minn.

ONE of the early studies demonstrating the transmission of communicable diseases by means of insanitary drinking fountains was undertaken by Pettibone, Bogart, and Clark, at the University of Wisconsin, in 1914.[1] They studied an epidemic of septic sore throat at this university which was quite definitely associated with certain drinking fountains then in use. As a result of their studies, they recommended the slanting stream type of fountain. During the year 1917,

investigations were conducted by the writer at the University of Minnesota, which showed that 80 per cent of the fountains examined at the university were infected with streptococci.[2] As a result of this investigation, a type of fountain was designed with the view of eliminating, as far as practicable, the dangers associated with the types then in use. Bacteriological results obtained after the installation of the new design showed that the desired results had been accomplished.

For a time it appeared that health officials were taking a keen interest in the drinking fountain problem, but for several years only a lukewarm interest has been taken in the situation. During the past two years, I have paid special attention to the drinking fountains located in public places in cities that I have had occasion to visit, throughout the country. I have been astounded at the number of apparently insanitary types of drinking fountains in nearly every section visited, including Minnesota.

I was very deeply impressed during the past year, while visiting a large public school, to see a long line of kindergarten children led to a drinking fountain of a most insanitary type. In this case, the fountain was of the vertical stream type, so designed and operated that it was practically necessary for each child to place his lips around the point at which the water emerged. To make the situation still worse the fountain was operated intermittently and after each operation the water receded into the nozzle carrying with it any droppings from the mouth of the consumer. This infected material remained there to be deposited in the mouth of the next consumer using the fountain. I counted a line of 25 kindergarten children at this fountain, each—so to speak—sucking the same metal bulb. I can scarcely imagine any more direct way of transmitting communicable diseases associated with discharges from the mouth.

The situation in this state became so apparent that on January 15, 1929, the Minnesota State Board of Health passed the following resolution which was sent to the public throughout the state:

WHEREAS, public drinking fountains have largely replaced the common drinking cup and are provided in a great many places accessible to the public, and

WHEREAS, investigations have shown that disease producing bacteria may be transmitted from one person to another through the use of improperly constructed or improperly operated drinking fountains, and

WHEREAS, the observations made by the State Board of Health have revealed the presence of insanitary types of drinking fountains in many public and semi-public places throughout the state, therefore, be it

RESOLVED, that the attention of the public be drawn to the fact that not all drinking fountains are satisfactory, and that to be sanitary, drinking fountains should conform with the following general requirements:

1. The jet of water emerging from the fountain should be slanting so that discharged water does not fall back onto the surface.

2. The orifice from which the water emerges should be protected in such a manner that it cannot be touched by the lips or be contaminated by droppings from the mouth or by splashings from the base beneath the orifice.

3. An adequate supply of pure water under sufficient pressure properly controlled should be provided in order to insure satisfactory operation of the fountain.

The board considers the situation to be serious and, after giving the public adequate time to consider the problem further, more positive action may be taken to remedy the condition.

When one stops to consider the number of different communicable diseases that are transmitted through discharges from the mouth and nose, it is easy to conceive that insanitary types of drinking fountains may become an appreciable factor in the transmission of the respiratory diseases.

The committee has made an excellent report, and I hope it will be instructed to continue its good work and to prepare a set of standard specifications for the construction and operation of sanitary drinking fountains.

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Milk-Borne Outbreaks of Disease in the United States and Canada in 1928

A TOTAL of 43 milk-borne epidemics involving 2,129 cases and 94 deaths were reported by state and provincial health officers in the year 1928. Twenty-four of these outbreaks were of typhoid fever, involving 408 cases with 41 deaths. Ten of the outbreaks were of scarlet fever, involving 407 cases with 5 deaths. There were 3 outbreaks of undulant fever, involving 29 cases with no deaths. The most serious outbreak was that of septic sore throat at Lee, Mass., involving 950 cases with 48 deaths.

The danger of typhoid carrier infection in relation to milk is shown in an outbreak of typhoid fever in San Francisco, involving 63 cases and 11 deaths, in which a carrier was employed at the capping and bottling machine at a pasteurization plant. The pasteurization of the milk supply was satisfactory, but the carrier evidently infected the milk when bottles were returned for refilling and capping. A typhoid outbreak in Sullivan County, N. Y., involved 7 cases and 2 deaths. A carrier responsible for the outbreak was found on investigation to have caused about 35 cases of typhoid fever over a period of 20 years. This particular carrier operated a store and a one-cow dairy and distributed raw milk. The outbreak at Rutland, Vt., involved 16 cases and 3 deaths. The typhoid carrier was found among the employees of the dairy on whose route the cases occurred. The carrier was a man 63 years of age, who had typhoid fever at the age of 15.—*Monthly Bull.*, Indiana State Board of Health, August, 1929, p. 122.

Research in Student Health

R. W. BRADSHAW, M. D.

College Physician, Oberlin College, Oberlin, O.

THE field of student health offers opportunities for research found probably nowhere else in the realm of the medical sciences. This branch of medicine is comparatively new. The viewpoint offered is unique and is not to be found in the other branches of preventive or curative medicine. It has become a specialty in which are incorporated certain features from the field of clinical medicine, others from preventive medicine and public health, and still others which have been born in college and university departments of physical education.

Because it is new and because it has this background it opens up new avenues of approach to the solution of many health problems whose significance has not been appreciated in the past. In this new enterprise we find opportunities for the study and correlation of facts and sciences which have hitherto been valuable in their own sphere, but have lost much of their practical social value because there were no means of arriving at their full interpretation. Research in physical education, clinical medicine, and public health, is currently achieving fresh objectives. New avenues of social service are being rapidly opened. In the realm of science generally and especially in the field of the biological sciences, relationships are of greater significance than isolated factors. Progress is bound to be both stimulated, and more effectively directed, by the natural impact of one branch upon another. The essential unity of all problems relating to human health and discoveries growing out of their study finds full opportunity for expression in the work of the department of student health. Constructive ideas conceived and nurtured in one branch can be adopted and applied to the full measure of their potential usefulness in allied fields. Developments and discoveries in any direction can be adjusted to throw a broad as well as an intensive light. In the student health laboratory one may study the effects upon carefully selected and easily controllable material of propositions germinated in each of the sciences concerned with health. Here lies a field fertile in its possibilities for planning, administering, and testing in a practical way the most significant correlations. That it has long been neglected makes it all the richer in its potentialities.

In the field of student health we may promptly dismiss from our consciousness the inspiration to investigate merely to satisfy the desire for exploration. The million students who every year present themselves to us furnish invaluable material and tools for the working out of problems which *directly* affect their present and future health, and their usefulness to the world. The immediate and practical social value of research in student health is incalculable. Is it not significant to discover, for example, whether the students who have experienced a well rounded 4-year health program are more able to live well after leaving college than those not enjoying this phase of education? Have they cultivated a more scientific attitude toward disease? Storey[1] has contributed an outstanding monograph in this field in which he points out the opportunity the student health service has to produce graduates who will be characterized by "habits of periodic health examination" and by an "experienced discriminating judgment in the selection of scientific health advisers, services, and consultants." Diehl[2] has given an excellent summary of the research already done in this particular field and has proposed a most comprehensive program for future efforts. Our institutions of higher education have it in their power to send out 100,000 graduates annually, taking places of leadership in their various communities and in the nation, who could in one generation bring about the practical application of our knowledge of disease prevention and health conservation.

Certain researches may and should serve to stimulate a restudy of our convictions about the value of medical or surgical treatments which have hitherto held unassailable positions in medical practice. For example, Forsythe[3] concluded from his investigation of the incidence of acute disease in tonsillectomized and non-tonsillectomized students that: "There seems to be little if any significant difference between the health of students who came to the University of Michigan with or without having had the operation of tonsillectomy."

One difficult problem which should be worked out carefully is that of health appraisal. A system of evaluating physical defects, health habits, illness disability, and the individual's health status on an established uniform basis and of conferring health grades similar to our methods of awarding scholarship grades would be of great value in this work and would offer an excellent runway from which to take off for improvement in many phases of the work as well as be a stimulus to the student to better his condition. Standards of this kind would stimulate studies which involve comparisons between health conditions of a general population group and those on the campus. Such standards are indispensable in properly evaluating the results of procedures

currently used in health conservation. Smiley[4] at Cornell University has attacked the subject and has worked out a useful basis, a modification of which has already been utilized in industrial medicine by Sappington.[5]

PREVENTION OF ACUTE DISEASE

There are a million students daily bringing to our door ailments which previously have never come to the attention of anyone who was capable of, or interested in, recording and studying them systematically. The average patient consults the physician only when symptoms have advanced to such a state that relief is demanded. The student health service invites the patient to seek scientific medical advice at the earliest suggestion of variation from the normal. This is the stage of disease, in the large, never before presented to the physician for study. These are the physical conditions which offer a mass of data crying for interpretation. In this stage of disease prevention can be practiced in a telling way. Here we have untold opportunity to offer humanity proven theories regarding health conservation which will be of large social value.

PREVENTION OF DEGENERATIVE DISEASES

Another challenge which faces those responsible for the health of youth lies in the increase of the insidiously developing chronic diseases such as cancer, arteriosclerosis, heart disease and diabetes. Although the life span of the infant has increased 10 years since 1900, the expectancy of the middle aged person shows no significant improvement. A *larger* percentage of the population each year is reaching the age period when the chronic degenerative diseases demand their toll. Every year chronic diseases of the heart, kidney, and arteries select a distressingly large proportion of their victims from those in the prime of life, and we are practically helpless in preventing these disasters. But there are many reasons to make us believe that the infections of youth, and the health habits established during college life, may very well be contributing factors in such deaths, and prevention of these pathologic tendencies may be possible in the college age period. Can we not determine what significance should be attached to the many transient albuminurias we find? What of the many transient hypertensions or glycosurias or the psychoneuroses? Some of these questions require years for solution, but if a beginning be made in the college age period with careful and complete records of even the minor ailments, in most of our institutions it will be possible through the alumni organizations to obtain fairly complete histories of major health data regarding a large percentage of graduates.

Correlation of these data with health records of the students for four years in college will enable us certainly to solve some of the problems mentioned above.

MENTAL HYGIENE

Only comparatively recently have functional mental disorders been studied scientifically and we are beginning to realize how close is the relationship between emotional imbalance and failure in life. Jastrow[6] says, "This is the psychoneurotic age. As the result of our strenuous order of living the nervous and mental disorders outnumber all other forms of ailments. One dismal prophecy announces that, if the increase of psychoneuroses and mental disorders continues for another generation, there will be about enough mentally fit individuals in the community to take care of the mentally unfit and the human race will have no other occupation."

A distressingly large percentage of our graduates are victims of emotional imbalance which condemns them to a life too full of misery. When faced with the challenge of adjusting themselves to the baffling array of demands set by our modern mode of life they develop a pathologic behavior which precludes the possibility of a wholly successful outcome in their pitiful struggle. They become helpless dependents, incapacitated with periodic aches and paralyzed with fears. Is it not our responsibility to learn how to cultivate in our students an emotional control which will enable them to meet the trying situations which life presents? The youthful student steps from his sheltered home into college life with its scholastic and social demands immediately imposed upon him in a wholly unfamiliar environment. The customary supports have been left behind. Right here we are presented with a unique opportunity to study the outcropping and development of previously unsuspected emotional stigmata. He appears at the health service with a complaint of incapacitating fatigue; or in an attempted escape from reality he may develop a digestive disorder which drives him to bed in the infirmary. We shall not trace him through his sombre future, but stop to consider the challenge he offers us for the solution of his dilemma, which is the dilemma of thousands. It is a lamentable fact that up to the present time absolutely no effective program for rehabilitating those afflicted with functional mental disorders has been presented. Occasionally we achieve what seems to be a remarkable cure, but these are the exceptions rather than the rule. Can we not make more accurate measurements of the emotional life of the individual? Can we not measure objectively, with the help of the psychiatrist, the psychologist, the personnel

officer, the student's emotional life, his ability to adapt himself to his environment, his variation from what might be established as normal? Can we not then train his emotions?

HEALTH AND ENVIRONMENTAL FACTORS

University and college life imposes on the individual a unique set of conditions. These conditions pertinently affect the health of the student. There is no other large group of people who can be so well moulded into an experiment as the average college student body. They are intelligent and coöperative. Our observations may be carefully made and accurately checked. With the inauguration of the personnel work in our colleges we have placed at our disposal an array of pertinent facts concerning each individual never before assembled. The comparison of the health status of a group exhibiting a certain set of characteristics or subjected to certain environmental factors either before or during the college years with the health status of another selected group will reveal conclusions of widespread applicability in our efforts at health conservation. It should be remembered that the mere realization of the relationship between incidence of tuberculosis and financial status of the patient was one of the most important factors causing the rapidly declining death rate of that disease witnessed during the past few years.

At Oberlin College the writer[7] investigated the incidence of illness among self-supporting and financially independent students, and found a significant difference in the amount. The students working their way suffered an incidence approximately 30 per cent greater than their financially carefree colleagues. Many other correlations of this sort may easily be worked out and will usually lead to worthwhile conclusions.

NUTRITION

The student health service is in a strategic position to undertake systematic and practical experiments in the field of nutrition. Emerson[8] has demonstrated a relationship between scholarship and the state of nutrition. There is general agreement that a close relationship exists between nutrition and general bodily resistance to disease. It should be comparatively easy to institute experiments which could be well controlled and carefully checked in a few of our institutions, the results of which should perhaps emphasize distinct advantages of a particular diet in its ability to stimulate and sustain hard mental work. Ever since the classic studies of Chittenden and his coworkers, we have been inclined to believe that a comparatively low protein allowance may be tolerated without the development of any signs of

malnutrition, or indications of any decrease in well-being. Many workers are beginning to doubt the validity of this teaching.[9] We are not at all convinced that the commonly recommended diet of our college boarding halls contains proteins, adequate either in quantity or quality.

EPIDEMIOLOGY

The periodic dismissal of a large number of students at vacation time, and their reassemblage from all parts of the country into a set environment several times a year, places under our immediate control factors which are significant in determining the nature of epidemics. In this situation elements such as virulence of virus, duration and completeness of immunity, intimacy and extent of contact, which are determining factors in disease spread, are forced to the surface where they may be isolated and studied as distinct units.

To mention but one of our problems in epidemiology, the common cold, the most prevalent disease with which we deal, and the greatest time-waster for students, has not yet been brought under control. Although we have not determined the cause, we are convinced that its contagiousness is its strongest offensive weapon. Careful researches into this phase of epidemiology will yield rich rewards.

SUMMARY

Student health is a new science. In this field is offered an opportunity to study disease and health from a new vantage point, and an opportunity to correlate effectively health data derived from various sources. In the health service are assembled data regarding the stage of disease never before systematically studied on a large scale. Unique opportunities for research are offered in the field of health appraisal, disease prevention, nutrition, mental hygiene, and epidemiology the results of which will be of immediate practical social value.

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EDITORIAL SECTION

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THE FIFTY-EIGHTH ANNUAL MEETING

THE meeting in Minneapolis was a success, though the attendance was not up to what was hoped for and expected. There were 196 papers presented, many of which were of high quality. While no startling discoveries were announced, the several papers on the streptococcus and its relation to septic sore throat, scarlet fever, and erysipelas, which were read before the Laboratory Section, had especial value, looking toward the clearing up of the many difficulties which confront the bacteriologist in his study of this great enemy of the animal kingdom. Though oral hygiene has attracted much attention during the past few years, only one paper on the subject appeared on the program, though the Child Hygiene Section had nine sessions, alone or in connection with kindred organizations.

All the other sections of the Association were well represented, and many contributions of practical as well as scientific value were presented. The Public Health Education Section had an especially full program.

Among the foreign representatives attending the meeting were: Dr. Wu Lien Teh, Chief Consultant of the Minister of Health of China, and Director of Manchuria Plague Prevention Service, who delivered a paper before the Epidemiology Section entitled "Epidemic of Plague in Manchuria"; Dr. Jacobo Fajardo, Director of the Philippine Health Service, who gave a brief talk at the Health Officers Section dinner regarding advances in health conditions in the Philippines since the pioneer work of Dr. Heiser; and S. W. Tay, Chief Engineer of the Hawaii Health Department, who was the official representative for the Hawaiian Government.

Perhaps the chief interest in the session for members of the Asso-

ciation lay in the adoption of the amendments to the Constitution, the substance of which has already been published in the JOURNAL. These make for continuity of effort, and increase the democratic character of representation and selection of officers. For the first time a President and a President-elect were chosen. The latter will take office at the close of the annual meeting in 1930, after a year of close connection with the affairs of the Association.

The retiring President, George W. Fuller, gave much time to the reorganization plan, and was directly responsible for many economies as well as increased efficiency of organization, the gratifying result being that the Association is in a better financial condition than at any time in its history, and there is every prospect that it will continue in this favorable position.

All publications of the Association, including the JOURNAL, were put under a special committee to be selected by the Executive Board. Heretofore, the JOURNAL, and all other publications, have been directly under the Executive Board.

The citizens of Minneapolis as well as the State of Minnesota showed every hospitality possible. The arrangements were excellent, the Chairman of the local Committee being also the Mayor, who presented to President Fuller a key to the city, which, as he said, would open the doors of any places into which we wished to go, and also the doors of any other places into which we had strayed and might wish to get out of. The thanks of the Association are due to all who took part in making the meeting a success, and especially to Dr. R. O. Beard, who took on his shoulders much of the active work connected with preparing for the meeting.

DIPHTHERIA CARRIERS

THE health officer has no more puzzling problem than supposedly "healthy" carriers of pathogenic organisms. These people are unfortunates. They have committed no offense, yet are a menace to the community in which they live and move.

For several years, an intensive study of diphtheria carriers has been going on in London, reports on which have been published from time to time.[1] The carriers from a number of hospitals devoted to the care of infectious diseases have been assembled in one institution for the purpose of this investigation. A general conclusion is that pathological conditions, or physical abnormalities in the upper respiratory tract, are the chief predisposing factors in causing or maintaining the carrier state.

Only those who harbored virulent diphtheria bacilli for at least 12 weeks were considered chronic carriers. The condition was considered as cured when 6 consecutive negative cultures taken at intervals of 1 week were obtained. The necessity of this prolonged examination was shown in a number of cases, which after giving negative results for even as long as 5 weeks, became positive, and remained so for long periods.

The throat carriers were those most easily cured. Of 60 cases treated by removal of tonsils and adenoids, 17 harbored the organisms in the throat only, and of these, 16 were cured. Of the remaining 43, in whom the organisms were harbored in the nose or ear also, only 19 were cured. The tonsil most apt to harbor the diphtheria organism is small, ragged, septic, and with deep crypts. It was found that by clinical examination the tonsils which on removal would give cultures of the diphtheria germ could be foretold. The experience gained from this study indicates that the best time for operation is from 6 to 8 weeks after the infection—earlier than usually advised.

Nasal carriers, who are difficult to cure, were treated by autogenous vaccines made from the diphtheria organism and complicating bacteria. In 3 cases, only the Klebs-Loeffler bacillus was used. Of 38 cases, 16 were cured in from 1 to 9 weeks, the others remaining positive, though some showed improvement. The staphylococcus was the most resistant and persistent organism. An alkaline nasal douche containing bicarbonate, chloride and biborate of sodium, approximately 2 grains of each to an ounce of water, had a very satisfactory effect, the mucous membrane becoming healthy, and cultures negative. Of 55 cases treated, 27 cleared up in from 1 to 7 weeks, 16 after one or more relapses, and in 12 the treatment failed. Spraying instead of douching was unsatisfactory.

In 2 out of 3 refractory cases, the antrum of Highmore was opened, and from 2, diphtheria bacilli were isolated. Removal of the tonsils and adenoids in 16 nasal carriers gave cures in only 3.

The ear carriers were the most difficult to treat, and no satisfactory procedure was discovered, though vaccines, removal of the tonsils and adenoids, mastoidectomy, and nasal douching were tried. In many cases of supposed ear carriers, the organisms were found to be saccharose-fermenting diphtheroids.

The health of carriers was usually found to be extremely good, and seemed to have little or nothing to do with the condition or its persistence. The most important carrier is the one who harbors the organism in the nose.

This study emphasizes the common mistake of speaking of

"healthy carriers." The late Dr. Nichols[2] laid stress on the fact that the carrier condition generally indicated an incomplete cure, with persistence of pathological tissue, which is borne out by the observations here recorded.

REFERENCES

1. *Lancet*, July 14, 1928, p. 58.
2. Nichols, Henry J. *Carriers in Infectious Diseases.*

THE AWARD OF THE SEDGWICK MEMORIAL COMMITTEE

ACCORDING to the announcement made in the JOURNAL several months ago, the committee met at Minneapolis and considered the nominations which had been made for the Sedgwick Memorial Medal.

It was unanimously awarded to Charles Value Chapin, M.D., who has been the honored Superintendent of Health of Providence, R. I., for many years, and to whom all health officers look for enlightenment in health administration.

That the committee made a wise choice was proved by the universal approbation which its action received. The announcement was greeted with applause, and it can be said with certainty that throughout the land there will be no heartburning and no criticism of the committee's decision.

It was a matter of regret to everyone that Dr. Chapin's health prevented him from attending the meeting. The President with such members of the committee, and others whom he may select will make formal presentation of the medal at some time suitable to Dr. Chapin. We only wish that we could add to this demonstration by having every member of the Association present to assist in doing honor to Dr. Chapin on this occasion.

ASSOCIATION NEWS

NEW OFFICERS

1929–1930

President—A. J. Chesley, M.D.
President-Elect—Hugh S. Cumming, M.D.
First Vice-President—Louis I. Harris, M.D.
Second Vice-President—W. J. Bell, M.B.
Third Vice-President—F. E. Harrington, M.D.
Executive Secretary—Homer N. Calver.
Treasurer—Louis I. Dublin, Ph.D.
Chairman of Executive Board—W. S. Rankin, M.D.

EXECUTIVE BOARD

W. S. Rankin, M.D., Chairman

A. J. Chesley, M.D.
Hugh S. Cumming, M.D.
Louis I. Dublin, Ph.D.
W. C. Hassler, M.D.
Haven Emerson, M.D.
E. L. Bishop, M.D.
Matthias Nicoll, Jr., M.D.
Henry F. Vaughan, D.P.H.

Newly elected Governing Councilors with terms expiring in 1932

A. J. Douglas, M.D.
Louis I. Dublin, Ph.D.
John A. Ferrell, M.D.
A. W. Freeman, M.D.
W. H. Frost, M.D.
J. C. Geiger.
Ira V. Hiscock.
A. J. McLaughlin, M.D.
R. G. Perkins, M.D.
G. C. Ruhland, M.D.

The Fifty-ninth Annual Meeting will be held in Fort Worth, Tex.

RESOLUTIONS

Presented by the Committee on Resolutions, William C. Hassler, M.D., *Chairman,* and adopted at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

I. AMERICAN INDIANS

WHEREAS, the American Indians are the most neglected racial group in the United States from the point of view of health protection; and

WHEREAS, Secretary of the Interior, Dr. Ray Lyman Wilbur, has requested appropriations adequate to provide for a reasonable degree of preventive and curative medical and nursing services for the Indian wards of the Federal Government, and sufficient to bring to an end the chronic undernourishment of many children in the Indian boarding schools, be it

RESOLVED, that the American Public Health Association endorses his request for appropriations for these purposes and respectfully urges upon the President of the United States, and upon the Committees on Appropriation of the Senate and the House of Representatives

of the Congress, the necessity of prompt and liberal provision of funds to prevent the further spread of preventable, and particularly of communicable diseases among the Indians, and to provide suitable and sufficient food for the Indian children.

II. TOBACCO AND TOBACCO PRODUCTS

Your Committee on Resolutions begs to present to you for your earnest consideration an endorsement of the bill recently introduced into the Senate of the United States by the Honorable Reed Smoot providing (a) For the inclusion of tobacco and tobacco products within the scope of the food and drugs acts. (b) For the amendment of the food and drugs act so that claims made for food and drug products in any advertising medium subject to interstate commerce control should be under the same strict regulation now applied to labels or other descriptive matter on, within, or around the container in which the products are packed.

III. WILLIAM H. DAVIS

WHEREAS, the death of Dr. William H. Davis, Chief Statistician for Vital Statistics of the U. S. Bureau of the Census, on January 8, 1929, deprived the American Public Health Association and its Section on Vital Statistics of a valued and respected member, therefore be it

RESOLVED, that the Association and the Section on Vital Statistics record their admiration for, and appreciation of the services of Dr. Davis, and their deep regret at the loss of one of the most active and sincere workers in his branch of public health work, and enter on the minutes of this meeting the following brief biographical note:

William Horace Davis was born at Holyoke, Mass., July 21, 1871. He began his higher education at Amherst and from there entered Harvard where he was graduated with the degree of Bachelor of Arts in 1893 and the degree of Doctor of Medicine in 1897. He was resident physician at Massachusetts General Hospital for one year, following which he studied in Vienna and other places in Europe.

In 1900 he began the general practice of medicine and continued until 1908 when he accepted the position of Vital Statistician for the City of Boston, in which capacity he served until 1916 when he assumed the position of Chief Statistician for Vital Statistics in the U. S. Bureau of the Census.

When he entered the U. S. Bureau of the Census the birth registration area consisted of 10 states and the District of Columbia. Due to his intensive and well directed efforts this area increased to such an extent that at the time of his death it included 45 states, the District of Columbia and the Virgin Islands. During the same period the death registration area increased from 26 to 45 states and from 70.2 per cent to 95.5 per cent of the total population.

Dr. Davis was recognized by his associates in American vital statistics as one of the foremost among those who have devoted their lives to the improvement of this important branch of statistical science. He was known internationally in his profession, and at the Conference for the third revision of the International List of Causes of Death at Paris served as Vice-Chairman, and was instrumental in bringing about many improvements in the list.

For many years he had taken an active part in the affairs of the American Public Health Association, especially in the Vital Statistics Section. He served as a Vice-President of the Association in 1923–1924, Chairman of the Vital Statistics Section in 1919–1920, and served as both Chairman and as an active member of important committees, both of the Association and the Vital Statistics Section.

Those who knew him will remember Dr. Davis as a modest, kind-hearted, conscientious, and lovable friend and colleague and as one who adhered to the principles of honesty and fairness at all times.

It is recommended that a copy of this resolution, together with the biographical note, be sent to the widow, Mrs. Mabel Johnson Davis, with an expression of the Association's sympathy.

IV. IN MEMORIAM

Your Committee on Resolutions respectfully brings to the attention of the members of the American Public Health

Association the following list of the deceased members and Fellows.

They fought as brave soldiers.
They have now been discharged.
Their warfare has ended,
And their treasures enlarged.

The memory of our association with them will linger and their names be inscribed on our rolls forever.

C. B. Ball,
Chicago, Ill.
Charles W. Bartlett, M.D.,
Tampa, Fla.
Fred Berry,
Columbus, O.
Robert M. Boyd, M.D.,
Ft. William, Ont.
Isaac W. Brewer, M.D.,
Bath, N. Y.
Dr. R. O. Burns,
Pittsburgh, Pa.
A. M. Burt, M.D.,
Ballston Lake, N. Y.
R. S. Cooley, M.D.,
Cleveland, O.
William H. Davis, M.D.,
Washington, D. C.
George A. Dickinson,
Port Hope, Ont.
M. R. Donovan, M.D.,
Lynn, Mass.
William J. Fleming, M.D.,
Troy, N. Y.
Edward G. Folsom,
Mt. Clemens, Mich.
F. B. Forbes,
Boston, Mass.
Alonzo B. Foster, M.D.,
Fonda, N. Y.
Richard A. Gantz,
Muncie, Ind.
Samuel H. Gilliland, M.D.,
Marietta, Pa.
Joseph Goldberger, M.D.,
Washington, D. C.
John L. Gray, M.D.,
Caldwell, O.
Marinus L. Holm, M.D.,
Lansing, Mich.
Ruth M. Hutton,
Toronto, Can.
George T. Johnson, M.D.,
Terre Haute, Ind.
L. W. Leiter, D.Sc.,
Baltimore, Md.
B. F. Lowry, M.D.,
Cleveland, O.
C. G. McLaughlin, M.D.,
Dunkirk, O.
Edith H. Matzke, M.D., Dr.P.H.,
San Francisco, Calif.
John B. Mitchell,
Chevy Chase, Md.
D. E. Musgrave, M.D.,
Barboursville, W. Va.
Lockhart Nelson,
Hillsboro, O.
Ira W. Pickett,
Cristobal, C. Z.
Harry Rand, M.D.,
Chicago, Ill.
Charles A. L. Reed, M.D.,
Cincinnati, O.
Chandler P. Robbins, M.D.,
Columbus, O.
E. G. Schroeder, M.D.,
Bethesda, Md.
Horatio Z. Silver, M.D.,
Eaton, O.
Carl Speer, Jr., B.S., M.S.,
Baltimore, Md.
Thomas P. Walsh, M.D.,
Middletown, Conn.
Nannie L. Winn, M.D.,
Nashville, Tenn.
Edward A. Woods,
Pittsburgh, Pa.

V. THANKS TO MINNEAPOLIS

The Resolutions Committee recommends that this Association give a hearty vote of thanks and appreciation to the citizens of Minneapolis for the generous hospitality extended to it through his Honor William F. Kunze, Mayor and Chairman of the Local Committee on Arrangements, Dr. R. O. Beard, Secretary of the Local Committee, and Dr. Francis E. Harrington, Chairman of the Entertainment Committee, and for the excellent arrangements for the Convention in its new auditorium for the meetings of the 58th Annual Convention. It is further resolved that this Association commends the Educational Exhibit and expresses its appreciation and thanks to the Local Committee who were responsible for the same.

VI. SCHOOL PHYSICIANS

Your Resolutions Committee recommends the endorsement of the following regarding a higher education require-

ment and a higher salary rating for school physicians:

WHEREAS, school physicians as a class have not heretofore been adequately prepared for the work which our complex educational systems now demand; and

WHEREAS, school physicians have not heretofore been paid a salary sufficient to justify this additional training and to enable them to devote their full time and best efforts to this work; and

WHEREAS, it has become necessary to take definite steps to improve this situation; therefore be it

RESOLVED, that the American Public Health Association does recommend consideration of and action upon, by the various states, the following minimum requirements for school physician applicants hereafter applying:

1. Graduation from an acceptable medical school, one year of acceptable internship and a license to practice medicine in the state.

2. Six semester hours of graduate training in medical subjects relating to school health work.

3. Six semester hours in a school of education of work embodying the principles of health education and the organization and administration of same.

4. This twelve hours of graduate work must be completed within three years after certification by the state board of education.

And that they further recommend:

1. The establishment of a salary rating equivalent to that now granted the high school principals in their respective localities.

2. That this salary be subject to automatic increase according to length of service.

3. And that it be subject also to an increase commensurate with educational merit and progressive professional development.

This resolution has been adopted by the American Association of School Physicians.



A. J. CHESLEY, M.D.

ALBERT J. CHESLEY, M.D., PRESIDENT

DR. Chesley, Secretary and Executive Officer of Minnesota State Department of Health, was elected President of the American Public Health Association at the Minneapolis meeting, October 3, 1929—the fifty-eighth in the long line of Presidents beginning with Stephen Smith, who served in that capacity during the period 1872–1874.

Dr. Chesley was born in Minneapolis, Minn., September 12, 1877. While still a young man he began his public health work—first as nurse in the Minnesota Soldiers Home Hospital; then, after service as a private in Company F, 13th Minnesota Volunteer Infantry, 1898–1899, as nurse in the Minneapolis Smallpox Hospital for 6 months during the epidemic of 1900. In 1901 he entered the medical school of the University of Minnesota; and upon graduation was appointed bacteriologist under Dr. F.

F. Wesbrook, Director of the State Board of Health Laboratories of Minnesota. In 1919, he became epidemiologist in the Division of Epidemiology, and in 1912 director of this division; in 1914 he became director of the Division of Preventable Diseases.

At the request of the American Red Cross Headquarters of Paris, Dr. Chesley was granted leave of absence for overseas duty from May, 1918, until October, 1920.

He was public health expert to the A. R. C. Commission to France, and in 1919 was sent to Poland to work under the Commissioner to Poland, later himself becoming Commissioner to Poland.

At present Dr. Chesley is secretary-treasurer of the Conference of State and Provincial Health Authorities of North America and a member of the Board of Directors of the National Society for the Prevention of Blindness.

SEDGWICK MEMORIAL MEDAL AWARD

THE first award of the Sedgwick Memorial Medal has been made to Charles Value Chapin, M.D., Superintendent of Health of Providence, R. I. This medal, established by subscription from friends and former students of the late Professor William T. Sedgwick, President of the American Public Health Association in 1915, is awarded for distinguished service in public health.

Dr. Chapin was President of the American Public Health Association in 1927, and is internationally famous for his work in the control of communicable diseases. Announcement of the award was made at the General Session of the Fifty-eighth Annual Meeting of the American Public Health Association in Minneapolis.

The formal presentation of the medal will take place on a later, appropriate occasion.



CHARLES V. CHAPIN, M.D.

NEW MEMBERS

Ida M. Alexander, M.D., A.B., Lansing, Mich., Lecturer, Bureau of Child Hygiene, State Department of Health

Walter C. Allen, M.D., Rochester, N. Y., Previously Assistant Surgeon, U. S. Public Health Service; no official public health position at present

Gladyce L. Badger, San Francisco, Calif., Nursing Field Representative, Pacific Branch Office, Red Cross

George H. Becker, M.D., A.B., San Francisco, Calif., Epidemiologist, Department of Health

Maharaj Mom Chow Bichitr, Bangkok, Siam (Assoc.)

Waldimar T. Browne, M.D., Ph.D., New Orleans, La., Assistant Health Officer

Laura A. Cauble, New York, N. Y., Chairman, National Conference Board on Sanitation

Lane B. Cooke, M.D., Dallas, Tex., Director of Public Health

Hulda A. Bieri Cron, Evansville, Ind., Director, Evansville Public Health Nursing Association and Health Center

Laurence A. Cushman, M.D., B.S., West Hartford, Conn., Health Officer and School Physician

James E. Davey, M.B., Hamilton, Ont., Chief School Medical Officer

Florence Erna, R.N., Martinez, Calif., Public Health Nurse

Laurence F. Foster, Ph.D., Berkeley, Calif., Chairman, School Health Committee

William J. French, M.D., New York, N. Y., Director, Division of Public Health, Commonwealth Fund

Fern A. Goulding, Ames, Ia., Instructor of Hygiene, Iowa State College

Robert Graham, D.V.M., Urbana, Ill., Chief, Division of Animal Pathology and Hygiene, University of Illinois

Allen C. Hutcheson, M.D., Houston, Tex., Health Officer

Mrs. Ruth S. Kase, Salem, O., Nurse, Board of Education

Homer R. Keyes, M.D., Los Angeles, Calif., Hygiene Physician, Department of Health

S. Adolphus Knopf, M.D., B.S., B.A., New York, N. Y., Consulting Physician, New York Department of Health

Dr. George W. LaBrier, Edinburg, Tex. (Assoc.)

Cassius T. Lesan, M.D., Mount Ayr, Ia., Member Iowa State Board of Health

Ferdinand McKeige, Brooklyn, N. Y. (Assoc.)

Ella E. McNeil, R.N., Philadelphia, Pa., Director of Health and Nursing, S.E. Pennsylvania Chapter, American Red Cross

Ethel M. Mealey, A.M., New York, N. Y., Staff Associate, Division of Health Education, American Child Health Association

Jerome Meyers, M.D., New York, N. Y., Medical Industrial Inspector, Department of Health

Luella Olson, R.N., Jefferson City, Mo., School Nurse

Mabel M. Oskins, R.N., Vincennes, Ind., Visiting Nurse

His Royal Highness Prince Paribatra of Nagara Svarga, Bangkok, Siam (Assoc.)

Peter E. Peterson, Woodbridge, N. J., Health Officer

Paul S. Prickett, Ph.D., Evansville, Ind., Chief Bacteriologist, Mead Johnson & Co.

Robert E. Rhyne, M.D., Gastonia, N. C., Gaston County Health Officer

Sylvio Roch, M.D., D.P.H., Montreal, Can., Director of Public Health

Elbridge Sibley, M.A., Nashville, Tenn., Statistician, State Department of Public Health

Delight Stone, San Antonio, Tex., Director, Public Health Nursing

Ruth Tunnicliff, M.D., Chicago, Ill., Research Worker, John McCormick Institute for Infectious Diseases

J. C. Whitacre, M.D., St. Paul, Minn. (Assoc.)

Dorothy G. Wiehl, M.A., New York, N. Y., Assistant Director of Research, Milbank Memorial Fund

DECEASED MEMBERS

William H. Carmault, M.D., New Haven, Conn., Elected Member 1927

John W. Plant, M.D., Groton, N. Y., Elected Member 1917

BIBLIOGRAPHY ON INDUSTRIAL FATIGUE

A number of copies of the *Bibliography on Industrial Fatigue* are available in the Association Office. This is a supplement to Dr. Eugene Lyman Fisk's *Report* as Chairman of the Committee on Industrial Fatigue, which was presented at Third Session of the Industrial Hygiene Section in Minneapolis at the Fifty-eighth Annual Meeting of the A. P. H. A.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

The Effect of Closing and Fumigating Schools—The fallacy of closing and fumigating schools in attempting to control outbreaks of disease has been given considerable publicity in Pennsylvania. Definite information on how to control diseases in school by modern, effective methods has been described in *Pennsylvania's Health* published bimonthly by the Pennsylvania Department of Health, in *Hygeia* (April, 1929) and in the *Pennsylvania Medical Journal,* and in the *Pennsylvania School Journal.* Through these practically every physician, health officer, school principal and teacher is reached. But those who most need instruction do not read these articles, and in spite of all the appeals some local school or health officials order the closure and fumigation of schools. The desk of the writer receives from the newspaper clipping bureau notices of all schools which have been closed. No other report of such action by school boards is made to state officials.

Whenever it becomes known that a school has been closed because of contagious disease the local authorities are requested by the Department of Health to open the school immediately; institute daily examination of all involved classes at once and at the end of the incubation period; to exclude all suspects, to have all suspicious absentees followed and to report and to have quarantined all cases; and to abandon all fumigation and not to destroy any books.

The results of the closure and fumigation of schools are exactly what would be expected by public health authorities. Closing schools scatters the disease and fumigation does not control the infection. In 22 schools which depended upon fumigation only to stamp out their contagious diseases there was a total of 171 cases within a month before and just 300 within a month following the closure and fumigation. Fourteen schools attempted to check scarlet fever outbreaks with formaldehyde. Within a month before its use they had 91 cases of scarlet fever, and during the month following the fumigation 123 cases. Another rural school not included in the above summaries developed 4 cases of scarlet fever, closed and fumigated; then 4 more cases appeared, the school was again closed and fumigated; 7 more cases appeared and the school was again closed and fumigated, after which 23 more cases of scarlet fever developed. At that time the state first heard of the conditions; half of the cases had not been reported. The school principal wrote that " the school was closed January 21, February 4 and February 18 when the schoolrooms and halls were thoroughly wiped with a strong solution of Blank's disinfectant and then tightly closed and Blank's high power formaldehyde candles burned in them." The rooms and halls were well sprayed each evening after the last session with a strong solution of a much-advertised antiseptic. The state epidemiologist, quickly located 3 children with desquamating hands and the outbreak ceased.

Other diseases gave corresponding results when closure and fumigation were depended upon rather than personal examination of the children. Two schools with German measles had 32 cases before and 96 cases within a month after fumigating. Another school had 19

cases of measles before, and 30 after fumigating the entire building. Two with mumps had 13 cases before and 12 after closing. Another rural school used the same methods with diphtheria and had 3 cases before and 14 within a month after fumigating the building. A rural school in Bradford County with a few cases of measles closed, against advice, and the disease quickly spread to 2 other rural schools in an adjoining township, and when they closed, the infection quickly spread over the entire county.—Harold B. Wood, M.D., Epidemiologist, Pennsylvania Department of Health.

Review of Health Conditions in Syracuse—The Metropolitan Life Insurance Company has recently published for the General Federation of Women's Clubs a review of health conditions in Syracuse, N. Y., and a statement of the needs of that community. The appropriation of the department of health for the year 1927 was $1.28 per capita. This sum was further increased by 40c per capita from contributions of the Milbank Memorial Fund and the Budget of the Department of Public Instruction.

A timely and extremely readable résumé of the health work in Syracuse for 1928 will be found in the last annual report of the Milbank Memorial Fund.

Diphtheria Prevention in Philadelphia—The September issue of the *Monthly Bulletin* of the Philadelphia Department of Public Health contains the complete announcement of the second annual diphtheria prevention campaign now being inaugurated in that city. Included in the report are reproductions of cards and forms used for educational purposes.

LABORATORY

C. C. YOUNG, D. P. H.

AN OUTBREAK OF BOTULISM FROM HOME-CANNED BEETS

WILLIAM LEVIN, DR. P. H., FELLOW A. P. H. A.

Director, State Hygienic Laboratory, Portland, Ore.

ON THE night of March 8, 1929, Mr. I. C. G., aged 51; Mrs. I. C. G., aged 37; Mr. P. A. S., aged 50; and Mrs. P. A. S., aged 55; ate a meal at the home of I. C. G., The Dalles, Ore. At this meal were served meat loaf, mashed potatoes, lettuce salad with mayonnaise dressing, vinegar beets, bread and butter, and blackberry pie. Mrs. I. C. G. also ate some Jello.

About 16 hours later Mr. G. complained of dizziness and nausea. He vomited. Disturbance of vision became marked. Diplopia and paralysis of the tongue and muscles of the pharynx set in. Constipation was marked. He was first seen by Dr. Fred F. Thompson, The Dalles, on March 11, and he died on the same day. All the other persons who ate at the meal had eye symptoms, nausea, and vomiting, but recovered.

Of the foods eaten at the meal the

meat loaf (beef sausage) was bought at the family butcher shop, and had been baked sufficiently long enough to rule out bacterial infection. Mrs. G. stated that the loaf was off-taste. Other persons, however, had bought and eaten of the same beef sausage, and no cases of infection or poisoning had occurred. The beets were the only other food which could be suspected.

Mrs. G. had opened a quart jar of home-canned beets on March 8, and after pouring off about half of the liquid, had replaced it with vinegar. She stated that she detected a slight odor to the beets, and this was corroborated by her husband. Neither, however, thought much of it, and they ate of the beets at both the noon and evening meals. The beets had been canned by a neighbor late in the summer of 1928. They had been subjected to 3 hours of boiling in a kettle closed at the top, but not under pressure.

A portion of the suspected beets was recovered for examination. On opening the jar a distinct putrefactive odor could be noticed in spite of the rather marked vinegar odor accompanying it. Several of the beets were slightly soft, but in appearance were in no way abnormal. Another jar of beets obtained from the neighbor who had canned the beets was found to be normal in all respects.

One c.c. of the beet juice was fed to a guinea pig. Death occurred in 12 hours. Another guinea pig was fed with about 2 gm. of solid beet; death occurred in a little over 24 hours. Beef digest broth cultures were made from both the juice and solid beets. *Cl. botulinus* was obtained after 5 days' incubation from the juice culture only. (Through the kindness of Dr. Karl F. Meyer, University of California, the organism was identified as *Cl. botulinus*, type A.)

It is interesting to note that a hen fed with 3 to 5 gm. of the solid beet showed practically no symptoms of poisoning. Five c.c. of the beet juice fed the same hen about a week later also had no effect on her. Presumably she had developed sufficient antitoxin to protect her against a toxic dose. That the strain of *Cl. botulinus* present in the toxic beets was not a powerful toxin producer was evident, since there was only 1 fatality among the 4 cases, and it did not produce toxic symptoms in the hen. The patient who died had previously been under a physician's care for heart trouble.

It is doubtful whether the vinegar had any influence upon the toxicity of the beet or its juice, except in so far as it acted as a diluent. In an outbreak of botulism occurring at Albany, Ore., in 1924,[1] 12 persons, ranging in age from 18 months to 76 years, partook of a bean salad, and all 12 died. The beans were home-canned and were served with vinegar, cream and sugar.

Cl. botulinus is found in many of the soils of the Pacific Coast states. The spores of *Cl. botulinus* have been found in 31 per cent of the soils examined from Oregon, 80 per cent from Washington, and 29 per cent from California.

The outbreak at The Dalles is the seventh occurring in Oregon. Altogether there have been 21 cases and 17 deaths. All were caused by home-canned foods. Four outbreaks were traced to string beans; 1 to corn; 1 to turnips; and 1 to beets.

REFERENCE

1. F. D. Stricker, W. Levin and R. L. Benson, Botulism in Oregon, *Northwest Medicine*, 316, 23, 1924.

RECENT DEVELOPMENTS IN THE CONSTRUCTION AND OPERATION OF THE PHOSPHORUS ANAEROBIC JAR

PHILIP L. VARNEY

Department of Bacteriology and Immunology,
Washington University School of Medicine, St. Louis, Mo.

SEVERAL years ago the writer described a method for producing strictly anaerobic conditions by burning phosphorus within a tightly sealed glass jar containing the cultures.[1] While quite satisfactory for most purposes when operated as described, continued use of the jar has shown the necessity for certain changes in its construction and mode of operation, as described below.

The use of galvanized steel or iron wire for the construction of the Petri dish holder, as recommended in the original article, has been discontinued, and either ⅛-inch monel or ⅝-inch brass rod substituted. While the commercially manufactured holder is constructed of monel, brass rod has been found to be more satisfactory and more easily worked when the apparatus is to be made in the laboratory, and is to be recommended for this purpose.

A disadvantage of the old type of frame was that after a period of use of from 6 months to 1 year, concretions of metallic salts formed on the metal, making it very disagreeable to handle, resulting eventually in the total disintegration of the frame. While a very small amount of metallic salts form on a brass frame after several years' continued use, these may be easily removed, and in no way detract from the strength of the apparatus. Monel frames are entirely resistant to the action of the phosphorus and its salts and from the standpoint of cleanliness and durability are superior to either iron or brass.

Because of the great variation in size of the standard 5 by 12-inch museum jars available, it has been found practical to make all frames small enough to fit inside the smallest jar encountered. A frame with an outside diameter of 11.2 cm. and a height of 26 cm. has been found suitable for all 5 by 12-inch jars now sold. The platform should be made 2.5 cm. from the bottom, as shown in Figure I.

Due to their direct contact with the phosphorus and its flames, and the resulting powerful chemical and physical action exerted upon them, the galvanized iron cup for holding the charge of phosphorus, and the gauze screen support originally described, are very short lived, and should be replaced by a monel cup 5 cm. wide and 3 cm. high, and ¼-inch mesh monel metal supporting screen 6 cm. in diameter and 4 cm. high. Because of the highly resistant character of such apparatus, the need for replacements is entirely obviated.

It has been found that when the apparatus is operated as described in the original article, due to the high moisture content within the jar the charge of phosphorus rather quickly becomes covered with water, so that no further oxidation could take place should a leak occur. Furthermore, when placed directly in a metal holder, the phosphorus burns but slowly. It is important, therefore, to protect the phosphorus from the action of these agents, which may be done by placing calcium carbonate (precipitated chalk) in the bottom of the phosphorus cup and tamping it firmly to a depth of about ½ cm. This bed of calcium carbonate acts as an excellent blotter, absorbing all of the excess moisture, and allowing a much more rapid oxidation of the phosphorus than before. It also acts indirectly as

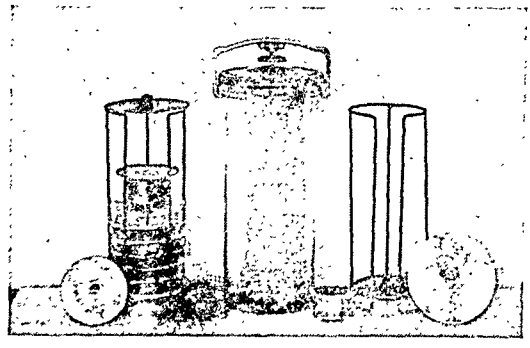
a safety factor, since dry phosphorus will further oxidize on the least entry of oxygen through a poor gasket, thus keeping the atmosphere entirely devoid of free oxygen.

The tin or paper cover (F) described in the original paper should not be used, since it has been found that this leads to the condensation of a great deal of water in the plates, with a consequent increased possibility of contamination. The more satisfactory alternative is to place a sheet of 11 cm. filter papers between each of two Petri dishes, or several sheets above the test tubes, thus effectually protecting them from the deposit of phosphorus trioxide, or from an excess condensation of water.

The asbestos discs used to protect the jar from the action of the phosphorus flames have been somewhat modified, being made as shown in Figure I. A 2 cm. hole is cut in the center of the lower disc so that when the disc is placed in position over the phosphorus, this hole acts as a chimney, drawing a constant supply of fresh air over the burning phosphorus, increasing the rate of exhaustion of the oxygen. The heated air passes upward through this chimney and impinges against the upper disc placed on top of the frame, and thence back to the bottom of the jar. The convection currents very quickly bring the available oxygen to the point of oxidation, with a consequent decrease in the time necessary to produce anaerobiosis, and give a greater factor of safety, since but very little flame impinges on the glass walls of the jar.

The amount of water entering the tubes or inverted plates is usually negligible, but may be quite large in amount if the plates are left in the jar for long periods of time. The deposition of water may be almost entirely eliminated if a small amount of sodium chloride is placed in the water at the bottom of the jar. While this effectually prevents the condensation of water within the tubes or plates, it is disadvantageous to use this method for stock cultures or plates

FIGURE I



PHOSPHORUS ANAEROBIC JAR SHOWING PARTS, WITH A PLATE HOLDER LOADED AND READY FOR INCUBATION

incubated for long periods of time since it leads to the extraction of water from the culture medium, and a consequent decrease in viability of the cultures. While practically all of the common anaerobes may be kept for 6 months to 1 year on blood agar slants within the jar, the cultures die out in a very few months when salt is added to the water.

In selecting jars for use as anaerobic chambers, care should be taken to use only those with a heavy glass shoulder, sufficiently strong to withstand the pressure when the cover is tightly clamped on. Jars having weak shoulders will lead only to trouble through breakage and leaking.

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VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

The Problem of Heart Disease—Heart disease in all civilized countries is the leading cause of death and of a vast amount of physical impairment. During the examination of men for the World War, 5 per cent were found with organic defects of the heart, and 90 per cent of these were rejected for service. The total of all organic diseases of the heart was 30.74 per 1,000 men, the range being from 68.84 for the state of Washington to 16.29 for Wyoming. In the U. S. Registration Area, 211,976 deaths occurred from all forms of cardiac affections during 1927. The death rate has progressively increased from 165.0 per 100,000 population in 1915 to 196.2 in 1927. The rate for pericarditis declined slightly from 1.1 to 0.9 and that from acute endocarditis from 9.1 to 8.2. The increases are shown by angina pectoris and other diseases of the heart.

In England and Wales the total death rate from heart affections increased from 161.7 per 100,000 population in 1917 to 183.5 in 1927. A slight decrease is shown by pericarditis, whereas acute endocarditis shows a small increase. In New Zealand the death rate from heart affections increased from 143.7 in 1918 to 156.4 in 1927. For the Commonwealth of Australia the figures also show a steady rise in the number of deaths from heart disease. Comparing the aggregate rates for the 4 countries, it appears that the United States has the highest rate for all forms of heart diseases for the year 1927, or 196.2 per 100,000, compared with 183.5 for England and Wales, 156.4 for New Zealand and 133.8 for Australia.

The mortality rates given for the U. S. Registration Area for 1925 show immense variations. Thus, while the average rate for 1925 for the Registration Area was 185.5, it was 216.2 for the cities and 159.5 for the rural portions of the registration states. It was as high as 262.2 for New York and as low as 83.1 for Idaho. At the present time no explanation can be offered for these variations, except that they depend to a considerable degree upon the age distribution of the population. A strictly scientific study of heart diseases on the basis of mortality data at the present time is practically impossible. The unfortunate classification of "other diseases of the heart" is too large to justify definite assumptions as to the increase or decrease in particular forms of heart impairments.—Frederick L. Hoffman, *Spectator*, 123: 3, 23–25 (Aug. 29), 1929.

Bovine Tuberculosis in Children—A study of the incidence of bovine infection in children has been carried out for the past 3 years, in the Toronto district, under the auspices of the National Research Council of Canada. From a group of 168 children all under 14 years of age, a total of 190 strains of tubercle bacilli were recovered. Of the 190 strains identified, 160 which were recovered from 148 children proved to be of the human variety, and 30 strains recovered from 20 different children were of bovine origin. The oldest of these 20 patients was 12 years of age, and the youngest an infant of 5 months.

In the great majority of the cases from which the human type of bacillus was recovered, a history of contact to open tuberculosis was obtained, and in a certain proportion of the surgical cases, there was evidence of tracheo-

bronchial or pulmonary tuberculosis demonstrable on physical examination or x-ray. All these children reacted to tuberculin. In 65 cases of bone and joint tuberculosis, 63 were of the human type and 2 of the bovine type; in 32 cases of tuberculous meningitis, 31 were of the human type and 1 of the bovine type; and in 16 cases of tuberculosis of the lymph nodes, 4 were of the human type and 12 of the bovine type.

All the children with the bovine type of tuberculosis came from districts where pasteurization of milk is not carried out. None of the children, with the exception of 1 case, showed evidence of pulmonary or tracheo-bronchial tuberculosis. The evidence pointed to the alimentary routes of infection. From this study it appears that bovine tuberculosis is a factor in childhood infection in rural Canada, and in unpasteurized areas. Tissue localization of the bovine tubercle bacillus is peculiar in certain regions, the lungs being practically immune.—R. M. Price, *Canad. Pub. Health J.*, 20: 323–330 (July), 1929.

Economic Status and Incidence of Illness—This is the tenth morbidity study in the series carried out at Hagerstown, Md., by the U. S. Public Health Service. The survey was begun in the autumn of 1921. Approximately 1,800 households were visited, and classified in groups ranging from well-to-do to very poor. The usual association of crowding with economic status was observed, the average number of persons per room being 0.43 for the well-to-do, as against 1.18 for the very poor. A consistent association of illness incidence and economic status was indicated.

During the period December 1, 1921, to March 31, 1924, the well-to-do and comfortable group combined had an annual illness rate of 991 per 1,000 persons, as compared with 1,068 for the moderate group and 1,113 for the poor and very poor groups combined. Some general associations were noted between specific illness and economic status. Influenza and grippe rates ranged from 123.7 per 1,000 persons for the well-to-do to 149.0 for the poor; rheumatism showed a rate of 13.6 for the well-to-do and 21.4 for the poor group; headaches, nervous conditions, and accidents showed similar variances.

The commoner infectious diseases, diseases of the circulatory, digestive and eliminatory systems, showed no correlation with the economic status. Association of illness with economic condition is differently manifested for infants than for adults. For children under 4 years of age the illness rates from all diseases varied from 1,817 per 1,000 for the comfortable group to 1,554 for the poor group; for the 10 to 14 year group the rates varied from 1,263 for the comfortable to 1,179 for the poor; whereas in the older age groups, higher rates were found among the poor than among the comfortable. For ages under 4 influenza gave an illness rate of 131 per 1,000 for the comfortable and 99 for the poor, as against 151 for the comfortable and 172 for the poor in the 25 to 44 year group. The rates for infectious diseases, particularly whooping cough and chicken-pox, were higher among children of well-to-do parents than among poor children.

The proportion of all cases attended by physicians was 70 per cent in the well-to-do and comfortable groups, as compared with 43 per cent in the poor group. However, for diseases of the nervous system, non-venereal diseases of the genito-urinary system, diseases of the bones and organs of locomotion, and the general diseases, the proportion attended by physicians was as great among the poorer families as among those of higher economic status. The results of this study show that the illness rates as observed were higher for the poor than for those economically better off, and in general, those families

which were definitely better situated economically had more medical attention than the remainder of the population.—Edgar Sydenstricker, *Pub. Health Rep.*, 44: 1821–1833 (July 26), 1929.

Late Results of the Manitoba Epidemic of Poliomyelitis of 1928—A late analysis of the data concerning the Manitoba poliomyelitis epidemic of 1928 shows that of 272 cases concerning whose present or recent condition it has been possible to obtain data, 143 had completely recovered and 128 still showed some degree of paresis or paralysis. The total number of deaths attributable to the epidemic was 40. In April, 1929, a report of 161 cases made by the Medical Research Committee of the University of Manitoba showed the results of convalescent serum therapy. Of the 161 cases, 69 treated with serum in the pre-paralytic stage made a complete recovery, as compared with 7 cases treated after the onset of paralysis.

More recent data were available concerning 117 of the 161 cases dealt with in the earlier report. These results concern the condition of patients from the epidemic at least 6 months after partial or complete recovery from it. Of the 60 cases treated with serum in the pre-paralytic stage, 54 or 90 per cent appeared to have completely recovered shortly afterwards, and 52 maintained this condition. These late results confirmed the conclusions in the previous report as to beneficial treatment of convalescent serum when given in the pre-paralytic stage. Of 6 cases treated with serum in the pre-paralytic stage and subsequently developing paresis or paralysis, 1 showed a delayed complete recovery. Of 16 treated with serum after the onset of paresis or paralysis, 3 showed a delayed complete recovery, and of 32 untreated with serum, 10 showed a delayed complete recovery. These of course do not include earlier recoveries. The 5 cases treated with convalescent serum in the pre-paralytic state, which showed at the time of the earlier report some degree of paresis or paralysis, showed definite improvement in the recent follow-up. Eleven of the 13 who received serum after the onset of paralysis and still showed paralysis were improving. The same was true of 17 of the 22 untreated cases still showing paralysis. The majority of the cases exhibiting improvement were being given the recognized orthopedic treatment.

Recent data concerning 83 of 158 cases in another series were also available. In this second group, it was uncertain whether serum was given in the pre-paralytic stage or later. The conclusions were in general agreement with the group of 117 cases. All of the 6, and 23 of the 35 cases now exhibiting paralysis, in the groups who respectively did and did not receive serum, show definite improvement. The majority of these cases were also receiving orthopedic treatment. In the remaining 75 cases only a present report was obtained. Of these, 27 reported complete recovery, 45 had present paresis or paralysis and 3 deaths were reported subsequent to the earlier report. These findings show the beneficent effect of convalescent serum treatment when given in the pre-paralytic state.—Mary McKenzie, *Canad. M. A. J.*, 21: 291–294 (Sept.), 1929.

Mortality in Amsterdam, Holland—A report of the Amsterdam Bureau of Vital Statistics for 1928 shows that the birth rate, inclusive of stillbirths, was 18.8 per 1,000 population. Of the 13,530 live births, 586 died during the first year of life. This gave an infant mortality rate of 43 per 1,000 live births. There were 40 deaths from measles during 1928, as compared with 99 during 1927. Scarlet fever prevailed as an endemic disease but caused only 6 deaths. There were 48 deaths from

whooping cough. This disease was especially prevalent among children under 1 year of age, the mortality in this group being as high as in the 1 to 4 year group.

Diphtheria caused 22 deaths during the year. The fatalities from influenza were reduced from 186 in 1927 to 118 in 1928. There were 421 deaths due to pulmonary tuberculosis, and 938 due to malignant tumors. The puerperal mortality rate was 4.6 per 1,000 live births. There were 19 cases of puerperal fever. —*J. A. M. A.*, 93: 786 (Sept. 7), 1929.

The Birth Deficit in Germany—Before the War, the German Empire, with average annual totals of 2,000,000 births and 1,200,000 deaths, had an annual excess of births over deaths of about 800,000, or from 12 to 14 per 1,000 population. In 1927, there were 1,160,000 births or 18.3 per 1,000; 757,000 deaths or 12.0 per 1,000, and an excess of births over deaths of 403,000 or 6.4 per 1,000, which is about one half the pre-war status. However, this can be accounted for by the peculiar distribution of age groups. According to an analysis freed from the accidental data of the distribution of age groups, the death rate is 17.4 per 1,000 population as against 12.0 per 1,000 under the unadjusted computation.

The readjusted birth rate is not 18.3 but 15.9 per 1,000. Instead of an excess of births over deaths, this shows a deficit of 1.5 per 1,000 population, which is 10 per cent below the figure needed to keep the population stationary. The birth deficit in Berlin is 57 per cent, and the average birth deficit of the large cities of Germany is 42 per cent, as compared with 31 per cent for such metropolitan centers as Paris and London. The rural regions occasionally show birth rates in excess of the minimal requirement for the preservation of the population.—*J. A. M. A.*, 93: 473 (Aug. 10), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Feeding Chlorine Through Long Pipe Proves Satisfactory—At the Chain of Rocks Plant of the St. Louis Waterworks, the difficulty of transporting chlorine cylinders from the unloading floor to the chlorinators, a distance of 800 feet, led to the conveying of the chlorine by a pipe. Batteries of 8 cylinders each are connected, on the unloading floor, to manifolds, which in turn are connected to a ¾-inch galvanized pipe leading to the chlorinators. This passes through a pipe gallery where the temperature is always low. At first trouble was experienced with liquefaction. When a new battery of cylinders was turned on, the high pressure resulting from the low temperature caused the chlorine to spurt from the control valve, which soon clogged. This was remedied by installing a reducing valve on the long line and maintaining a pressure of less than 100 pounds per square inch. All liquefaction trouble has been overcome.—A. V. Graf, *Eng. News Rec.*, 24: 102, 1929. (From papers of Water Pollution Research Board, England.)

The Development of Water Supply After the War—After the war, water works in Germany suffered from lack of material, strikes, and depreciation of money value. Building was almost impossible though Wiesbaden rebuilt its water works by using unemployed labor. After the stabilization of the Mark other cities, for example Hamburg, proceeded with building and extension work. The removal of water works from state control to companies has been a great incentive to progress and economy. Taking into account the general depreciation of money values, water in most towns is cheaper than before the war. Works built after the period of inflation, however, are in a different condition and prices are often very high.

Many towns endeavored to raise the standard of their water after the war and ground water was largely substituted for river water. So-called "ground river water," i.e., water from wells sunk in the valley of a river and gathering the naturally filtered river water, has been used. At Wiesbaden this proved unsatisfactory and had to be treated with chlorine and ozone, and a supply of artificial ground water, water drawn from the river and treated, has been substituted.

Several epidemics of typhoid broke out and, though they were mainly due to fortuitous combinations of unfavorable circumstances, they led to more careful considerations of water works conditions.

Treatment with chlorine has increased since the war. Slow sand filtration has been largely abandoned, rapid filtration with subsequent chlorination being substituted. Water softening is also more practiced than formerly, especially owing to the growth in the use of high pressure boilers. Corrosion and incrustation of pipes has been investigated and the best means of prevention found in treatment of the water. Piston pumps are being largely replaced by rotary pumps.—E. Grosz, *Ztsch. f. Kommunalwirtschaft,* 8, 19: 460, 1929. (From papers of Water Pollution Research Board, England.)

Technical Progress in Water Works Management—The article gives examples of progress in water works management after the war. The great aim is to replace small water works with great central supplies providing water for larger areas. Such systems are being prepared in Middle Saxony and for supplies from the South and East Harz valley dams, which serve the purpose of the English storage reservoirs in supplying a very greatly increased summer need. It is also intended to use surface waters to increase and enrich ground water supplies.

In water preparation rapid filtration is quickly superseding slow sand filtration. Treatment with lime water for de-acidification and with chlorine for bacteriological purification have increased largely.

Control of operation by a works laboratory, which in the case of small works could be used in conjunction with neighboring works, is important.

Electric working of pumps either fully or partly automatically controlled is being more and more adopted. The general type of valve is the wedge-shaped but under special circumstances ball valves are being applied. These in some cases include in their casings instruments for measuring and recording the flow.

Lately ferroconcrete pipes have come largely into use. These consist of a thin sheet metal jacket reinforced inside and outside with ferroconcrete. De-acidifying of the water is especially important when such pipes are used. With main pipe lines special devices against flooding, with automatic or semi-automatic working, are installed. Emergency repair services for night

work or times of frost are essential. Movable indicators are used for showing defects, a simple type being the geophone, a highly sensitive drum with weight-stretched membrane.

For the welfare of the workers it is advisable for large works to procure the services of a safety engineer.—Vollmar, *Ztsch. f. Kommunalwirtschaft,* 8, 19: 467, 1929. (From papers of Water Pollution Research Board, England.)

Examination of Swimming Baths—In 1926 the two filter plants for the Munich public baths were replaced by one for which the same chlorinating plant served. Experiments and observations were carried out on the condition of the water and the effect of filtration and chlorination.

Condition of the Water. Chlorinating removed the smell which, though the water itself appeared odorless after 14 days' retention, had been previously noticed in the building. Kisskalt's method for estimating turbidity gave satisfactory conditions of clarity after 14 days' retention period. The pollution of the bath by bathers is discussed and details of different analyses before and after use are given. Chloride content generally varied, nitrates increased more or less substantially, dissolved organic matter seemed to show little change though when estimated by its chlorine combining power it rose definitely. Comparative analysis in the case of the Munich baths was difficult, for the water is drawn in varying proportions from two differing sources. Chemical and physical measurements of turbidity are more useful in estimating purity than chemical analysis of dissolved matter but the latter, especially in the case of nitrogen-containing matter, should not be neglected.

Chemical condition corresponds to a large extent to appearance but this is never the case with bacterial condition. In the first 2 or 3 days after a new filling the germ-count grows while the water remains clear, then it sinks and remains low while the water becomes more turbid and deteriorates chemically. The germ count therefore does not serve as a measure of impurity but it is useful to test the working of filtration and chlorination.

The danger of infection by bath water is very slight and is to be judged not by germ-count but by estimation of coli-titer. A knowledge of the health conditions of the city is necessary in estimating the possibility of danger.

Effect of Filtration. A Bamag filter, 870 mm. deep with graduated filling, varying from 20–30 mm. to 0.1–1 mm., is used. The bath is refilled every 14 days and has a daily fresh water addition of 5 per cent of its content. Filtration was found to remove 71 per cent of suspended, 74 per cent of organic and 50 per cent of inorganic matter. Experiments showed that a rapid flow-through had no effect on the bacterial count while very slow flow caused turbidity in the bath; therefore a flow of 75 cm. per hour, or 3.4 cm. through 1 square meter of filter per hour, was chosen, whereby the germ-count was decreased 50 per cent.

Effect of Chlorination. The Bamag direct process is used. The chlorinated water enters the bath continuously through numerous small holes in a pipe across the width of the bath floor. By a comparison of chlorine additions in various baths, Lemmel found that the amount rose almost proportionately to the number of bathers. To make the chlorine excess sufficiently strong to remove danger of infection in the bath itself requires an excess of 0.3–0.5 mg. per liter, which is unpleasant to the bathers and, by dissolving out organic matter from the filter, renders the water turbid. Hamburg meets the difficulty by a large dose of chlorine and then clearing the water with aluminum sulphate before filtration, but this must

cost considerably more than simple filtration. Lemmel and Olszewski demand in the swimming bath water an excess detectable by benzidin but not by zinc iodide starch reaction. This amount, however, affects filter working and leads to turbidity. When this excess was detectable in the flow-off, the author found chlorine smell over the filter and sometimes in the bath hall and some turbidity towards the end of the 14-day filling period. Bacterial count decreased but as this is not a criterion of purity and *B. coli* was as effectively removed by a lower chlorine dose, the chlorination used by Munich is only strong enough to give a definite excess in the entering water (0.35–0.4 mg. per liter) but not to be constantly positive to benzidin reaction at the flow-off.

References to literature on the subject are given.—H. Ilzhofer, *Gesund. Ing.*, 32, 51: 513, 1928. (From papers of Water Pollution Research Board, England.)

Economic Significance of Malaria to an Industrial Concern: A Railway—Recognizing the importance of determining in so far as possible the economic loss due to malaria in an area prior to recommending expenditures, this article describes the result of such a survey in one of the important districts in which the E. B. Railway operates in India. The summary given by the author briefly describes the type of survey made and the determinations, and is here quoted:

(1) A brief description of the physical features of the Lalmanirhat district of the E. B. Railway together with its malarial distribution has been given; (2) the district comprises areas of varying physical features with different degrees of malarial incidence; (3) the number of cases of malaria and the number of cases of all other sickness in the district for the three years 1924, 1925 and 1926 are given for comparison; (4) the number of days lost to the Railway on account of malaria amongst the staff is given, and this is compared with the number of days lost from all other sickness; (5) the monetary value of the number of days lost from malaria has been estimated for the three years 1924, 1925 and 1926 and this has been shown to be not a negligible amount; (6) what percentage of the loss from all sickness does malaria alone contribute? This has been calculated and incidentally the anti-malarial measures started in 1925 have been shown to have been effective in reducing the loss due to malaria from 43 per cent in 1924 and 50 per cent in 1925 to 35 per cent in 1926.

Three graphs and accompanying tables are included indicating the influence of malaria on total cases of sickness and days lost through illness of railway employees in the Lalmanirhat District.—C. R. Rao, *Indian M. Gaz.*, 63, 10: 568–573 (Oct.), 1928.

Rat-flea Survey of the Port of Norfolk, Va.—This report is one of a series of reports of rat-flea survey work done by the U. S. Public Health Service at various United States ports for the purpose of obtaining and recording data that might be useful in determining the bubonic plague hazard at such ports.

The fact that some United States ports have had bubonic plague infections while other large and busy seaports have escaped lends value to such data. An hypothesis for this condition which has been suggested is referred to as well as observations in India relative to *Xenopsylla cheopis*, which is the predominating rat flea in certain parts of that country. Mention is made of the view held by some authorities that *Xenopsylla cheopis* is the only flea that need be considered in the transmission of plague from rat to rat under natural conditions and of the *Xenopsylla cheopis* index as the measure of infectibility of any community. By *Xenopsylla cheopis* index is meant the average number of *Xenopsylla cheopis* per live rat in the locality under consideration.

The report discusses the methods employed in the rat-flea survey at Norfolk, the distribution of rats, the distribution of fleas, and includes a comparison of

the results with similar studies at other United States ports. Tables containing the above data as well as data for other ectoparasites encountered are included.

The conclusions of the report are as follows:

Upon the basis of the findings of the 12 months included in the period of this survey, it is evident that *Xenopsylla cheopis* is the predominant rat flea in Norfolk for 8 months of the year.

The *Xenopsylla cheopis* index (2.56) of Norfolk seems sufficiently high to warrant the sanitary authorities in considering the port as probably infectible with plague, and the port should be diligently guarded against the introduction of plague, especially during the warmer months of the year (June 1 to December 1). It appears that conditions in the city are highly favorable for the perpetuation of the rat genus and that Norfolk has, at least, the average density of rat population that prevails in most cities of the Atlantic seaboard.—

H. E. Hasseltine, *Pub. Health Rep.*, 44, 11: 579–589 (Mar. 15), 1929.

The Bacteriological Control of Shellfish—The bacteriological control of shellfish is one of importance because of (a) the preference of shellfish for localities where the density of the sea water has been reduced by admixture with fresh river water; (b) the presence of sewage in nearly all rivers; (c) the addition by enteric cases and carriers of the causal organism to such sewage; (d) the fact that shellfish are frequently eaten uncooked.

Two methods commonly employed in the examination of shellfish for *B. coli* are Houston's and Klein's. Both methods are described briefly in the article. Houston's *B. coli* standards for oysters are: strict standard = 100 *B. coli* per oyster; lenient standard = 1,000 *B. coli* per oyster.

Another method employed by Prof. Eyre (London) consists of using 0.2 c.c.m. of the mixed shell fluid and minced flesh from each of 10 oysters picked at random from a batch. If *B. coli* are absent in this volume the oyster is regarded as "clean." Oysters are allowed to be sold only where 60 per cent or more in a batch are clean.

The author of this article is concerned chiefly with the examination of mussels and uses essentially the method of Klein. Comparison with the results of other bacteriologists and with different methods reveals certain discrepancies resulting from the following causes: (1) Errors in technic; (2) alteration in the mussels due to delay or conditions of transmission to the laboratories; (3) errors in sampling.

The third cause is considered most important and responsible for most of the discrepancies in that there is a chance for a wide variation in the selection of mussels for examination and in the selection of the particular fraction of mussel fluid to be examined. For the above reasons Klein's method is criticised with the recommendation by the author of another method, as follows: That 0.5 c.c.m. of the mixed fluid from the mussel is added to 4.5 c.c.m. of sterile saline, yielding a 1 to 10 dilution. Of this 2 c.c.m. are added to one tube of lactose bile broth, 1 c.c.m. to a second tube and 0.2 c.c.m. to a third tube. A positive result in the respective tubes indicates 100 *B. coli* per mussel, 200 *B. coli* per mussel and 1,000 *B. coli* per mussel corresponding to the strict, moderate, and lenient standards. The strict and lenient standards are the same as those of Houston's and the moderate the same as Klein's. Application of the author's test in actual practice is also explained briefly.—J. W. Bigger, *J. State Med.*, 36, 11: 638–641 (Nov.), 1928.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Thirty Years' Experience of Industrial Maladies.—After 27 years as Senior Medical Inspector of Factories, the author is amazed at the progress which has been made. Especially noticeable is the progress in illumination and locally-applied exhaust ventilation. In 1899, only 2 of the 23 white lead works had a vestige of exhaust ventilation for the removal of dust. So it was, too, in the 866 brass foundries in Birmingham, England, when the author visited them in 1903 on the request of those suffering from brassfounders' ague. Now every white lead factory is equipped with a system of locally-applied ventilation, and the conditions in brass-casting workshops are vastly better. But more important than that is the spirit of invention in the trades themselves in the discovery of labor-saving devices.

Throughout these lectures I shall lay stress, as a kind of test, on three axioms which experience has led me to enunciate. They are: (1) Unless and until the employer has done everything, the workman can do next to nothing to protect himself. (2) If you can bring an influence to bear external to the workman (i.e., one over which he can exercise no control) you will be successful; and if you can't, or don't, you won't. (3) All industrial lead poisoning is due to the inhalation of dust and fumes; and if you can stop their inhalation you will stop the poisoning. It is not due to dirty hands (i.e., eating with unwashed hands).

Examples of the influences I have in mind are:

(1) Prohibition, e.g., by the substitution of sesqui-sulphide of phosphorus for yellow phosphorus (effected by the Berne Convention).

(2) Conversion of pulp white lead into oil paint ready for the market in automatic closed-in machines without dry grinding.

(3) "Low solubility glaze" in pottery manufacture, by which the same amount of raw carbonate of lead may be used, but so combined in calculated quantity with siliceous material in a "frit" as to be practically insoluble in the gastric juice.

(4) Plastic rubber, that is, rubber in which lead oxide has been incorporated in a "mother batch" to the extent of 90 per cent, thus abolishing production of lead dust in later processes (first put into practice by Mr. C. A. Klein, Chemist to the Associated Lead Manufacturers, Ltd.).

(5) Disinfection of anthrax-infected wool by formaldehyde—the Duckering process—as carried out in the Government Wool Disinfection Station (Home Office), Liverpool; and finally, though not quite so successfully,

(6) Locally-applied exhaust ventilation by a fan.

Examples of influences, useful up to a point, but no remedy, which are not external, but depend on the will or whim of the worker to use them, are respirators, gloves, goggles, washing conveniences and waterproof sandpaper.

The statistics of notifiable diseases were in a state of chaos, so that detailed figures did not commence until 1900. It was necessary to see that no case of lead poisoning was included more than once in each year—second notifications being probably due to relapse or incomplete recovery from the first attack. A defect in the system is that notification by the medical practitioner has to be made to a layman. It was a fortunate accident that Sir A. Whitelegge was a medical man. Generally speaking, any symptoms necessitating absence from work and appeal to a doctor for treatment constitute sufficient grounds for notification. The slow onset of these insidious, industrial maladies, in which the patient passes through

a stage of absorption, does not amount to poisoning.

The principal results achieved from notification in the case of 11 notifiable diseases and poisonings for the years 1900 to 1928 inclusive, are shown in a chart, after which are taken up in some detail the subjects of mercury, arsenic, and phosphorus poisoning, anthrax infection, toxic jaundice (trinitro-toluol poisoning), skin cancer, chrome ulceration, aniline and carbon bisulphide poisoning. Of chronic benzol poisoning only one case has been notified.

Concerning skin cancer in mule spinners the author quotes Twort, working in Manchester, to the effect that " the carcinogenic activity of an oil is much reduced or completely removed by extraction with sulphuric acid or by oxidation and by reduction." About 9 cases every month of skin cancer occur among the 33,000 mule spinners in Lancashire. The percentage of deaths is low—not 3 per cent among patent fuel workers (from skin cancer), about 9 per cent among tar distillers, about 33 per cent among cotton mule spinners, and over 47 per cent among retort house and pitch diggers in gas works. The reason for these differences, in the author's opinion, is that only a fraction of the cases is being reported in tar distillers and gas workers, while nearly all are reported among patent fuel and shale oil workers. The salient feature about skin cancer is that not 5 per cent begin to show the malady under 30 years of age, while the average age for contraction is about 52 years. Likewise, less than 3 per cent show the disease in dangerous form under 20 years' duration of employment, while the average exposure is approximately 40 years. " Periodic examination, therefore, should be limited to mule spinners aged 40 or over and with a duration of employment of 30 years." In compensation for deaths alone the cotton industry must anticipate paying 10,000 pounds a year until it realizes the value of periodic examinations twice yearly. Dr. Henry has gone a long way to prove that the incidence of skin cancer among the mule spinners results from the gradual change-over in the " sixties and seventies " from animal and vegetable to mineral oils, for the purposes of lubrication. —Sir Thomas Morison Legge, late H.M. Senior Medical Inspector of Factories. *J. Roy. Soc. Arts,* 4006: 1007–22 (Aug. 30), 1929.

The Organization of Treatment of Accidents and Diseases among Workers of Rand Mines—The gold mines under the control of the Central Mining Rand Mines Group, Witwatersrand, Transvaal, compose 14 gold mines, employing approximately 85,000 natives (Negroes of the Bantu race), and 10,000 Europeans. The depths of the workings vary from nearly 2,000 to nearly 8,000 feet below the surface of the ground. The average elevation of Witwatersrand above sea level is about 5,600 feet; thus the deepest mines reach a depth of about 2,000 feet below sea level. The actual mining is carried out with drills, using compressed air, and the blasting is done with great quantities of gelignite owing to the hardness of the strata, which are rich in silica. For the latter reason large quantities of water are used to keep down the dust, but this results in a saturated humidity. Temperature increases approximately 1° F. for every 200 feet of depth so that that of the deeper workings is high, and combined with a high humidity, necessitating potent ventilation to render working conditions possible. The natives are housed and fed by the mines, but supply their own clothing.

It is a part of the legal obligation of mine owners to provide the natives with free medical treatment for both diseases and injuries; also to provide

hospital accommodations equivalent to 2½ per cent of the number employed, as well as a sufficient number of full-time medical officers. Thus there are 3 central native hospitals having 1,264 beds; 4 other hospitals with 668 beds; and 7 clearing hospitals or dressing stations with approximately 415 beds. Both European nurses and native girls trained as nurses are employed.

On returning from work every native is inspected by a native watchman for injury or sickness, and for any such he is immediately conducted to an ambulance room where his medical care begins. A very elaborate organization has been built up for dealing with accidents; also a first aid training system. A considerable number of the Europeans and over 2,000 natives possess certificates in first aid (the equipment is described in detail).

The number of accidents is large and the medical staff can fairly be said to be highly expert in the treatment of same. For example, in the treatment of penetrating wounds of the knee a standard method has been devised:

> which has given surprisingly good results, consists of excising badly damaged tissues, if necessary widening the opening, washing out the joint with ether, applying a preparation known as Bipp, which is a bismuth, iodoform and soft paraffin paste, and closing up the wound. Light passive movement is started within a day after the operation, and continued with gradually increasing range. When the patient is able to walk about, apparatus intended to increase the range of motion is used. The one most commonly employed is in the form of a stationary bicycle, which the patient pedals against resistance offered by an adjustable brake band.

The most serious disease is pneumonia, the number of cases of which is very high although the case mortality is low, 12.29 per cent for the year 1927. The natives are also very prone to tuberculosis. Last year 529 cases of the pulmonary form were admitted to the hospitals with a case mortality of 62, or 11.72 per cent. This does not, however, include those sent home who were able to travel. It is admitted that in spite of the large amount of material no important contribution has so far been made to the therapy of either pneumonia or tuberculosis.

Hookworm disease infects some 60 per cent of natives recruited from Mozambique, and 20 per cent of those recruited in South Africa, but it is very rare to find any clinical symptoms of the disease among natives. The majority of natives arriving at the mines are suffering from vitamin deficiency, particularly of the antiscorbutic vitamin, with a tendency to hemorrhage from the gums and into the joints and muscles, as well as easy ulceration at the sight of slight injuries. On this account the diet of natives has been specially arranged to combat this condition of scurvy.

The medical service for European workers is elaborate. They receive half their average earnings when incapacitated by sickness or injury; medical attendance for themselves and members of their families for sickness, injury, and maternity; funeral expenses similarly; a lump-sum compensation for any disability sustained, and likewise to the estates in the case of death. Beyond this, some 12,000 pounds per annum are raised and expended voluntarily for the surgical treatment of serious accident cases. The employee is given wide choice of attending surgeons, while specialists are available for any case requiring them. In the past year 622 Europeans were given surgical attention for injuries at an average cost of 2.027 pounds per patient.

All employees undergo a routine physical examination which, in the case of natives, may include a radiographic chest examination. Each native is reexamined at intervals of not more than 6 weeks. About one third of the Euro-

pean applicants are rejected for employment, and the balance must be reexamined every six months. On the first detection of silicosis, one is warned. If any signs of tuberculosis are detected, he must cease employment as a miner. If the worker with beginning evidences of silicosis elects to retire, he is given a lump sum of 375 pounds or more, depending on his average earnings. Advanced stages of silicosis and silicosis with tuberculosis are given a life pension, to which the widow and children are also entitled.

At the central rescue training stations skill in the use of oxygen-breathing rescue apparatus is required, as well as in the use of Burrell All Service Gas Mask, and the methods of detecting CO underground. The writer is head officer of the medical organization described. —A. J. Orenstein, M.D., *Opera Collecta,* Fifth International Medical Congress on Industrial Accidents and Occupational Diseases, Budapest, 1929, pp. 475–483.

Perforation of the Nasal Septum in Chromium Workers—The affliction noted occurred among chromium platers using an electrodeposition: a fine mist rises aboves the process composed of chromic acid particles which may affect the skin or cause ulceration in the nose. (A review of the literature is cited.)

A series of 18 cases is here reported. In 2 workers, complete perforation of the nasal septum with openings ¼ inch in diameter were found after only 6 weeks' exposure. The process is painless; an irritated feeling is experienced when the worker first comes into contact with the fumes. It is not disabling. Most of the workers were unaware of the perforation. Bleeding was not severe and this only when the crusts were forcibly expelled. The sense of smell was impaired in only one case. Difficulty of breathing was not encountered save when crusts blocked the passage ways. In all cases the perforation was limited to the cartilage portion of the septum and at its posterior part. Hence the shape of the nose was never affected.

The first symptoms experienced upon entering the chrome room were sneezing and a burning sensation in the nose. After a few days bleeding was encountered, followed by crusting. A whistling sound during breathing was noted in the majority of cases when the perforation was small.

Protection of the workers is effected by a strong lateral suction in which the air velocity should be 2,000 feet a minute. Air velocity should be measured by a kata thermometer. The fumes being heavy should be withdrawn laterally (and downward). Proper ventilation of the nature described prevents the irritation.

In treatment, employees must be warned not to pick at the nose, the nurse should check up daily all cases of irritation, and ordinary plain vaseline to the septum causes all unpleasant symptoms to disappear.—Fred W. Dixon, M.D., *J. A. M. A.,* 93, 11: 837–38 (Sept.), 1929.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Green Tea as a Source of Vitamin C—Green tea has recently been reported as a rich source of Vitamin C. Miura and Tsujimura, the first investigators in 1924, reported that an infusion from a gram of green tea prevented scurvy in guinea pigs for 60 days. This was further substantiated by other workers using the curative method of experimentation. A 3-month feeding experiment was undertaken in the Bureau of Home Economics of the U. S. Department of Agriculture in which the protective method on guinea pigs was used. A Japan green tea labeled " rich in vitamin C " was used in the form of an infusion of a level teaspoonful to the cup infused 4 minutes. Only sugar was added to the tea infusion which was fed to guinea pigs which had been kept on a basal diet supplemented by cabbage and carrots until weight gains were noted. In addition to the animals receiving tea there were positive controls with orange juice and negative controls with the basal diet alone. The tea and orange juice were given 6 days a week. Tables are given of autopsy findings showing the severity of the bone changes and hemorrhages. Guinea pigs receiving 15 c.c. of tea lived on an average of 42.7 days and those receiving 10 c.c. of tea averaged 39.3 days, while the negative controls averaged 36.5 days. The animals receiving 2 c.c. of orange juice lived throughout the period of 90 days and made gains in weight with no symptoms of scurvy. Guinea pigs receiving tea lived slightly longer than the negative controls. It was concluded that the amount of vitamin C present in this tea is very small. Discrepancies between these findings and those of previous investigators may be due to the use by the former of milk in the tea and also to the probability of the presence of undepleted vitamin C in the animals when the curative method is used.—Hazel E. Munsell and Hilda Black Kifer, *J. Home Econ.*, 21: 514 (July), 1929.

Distribution of Vitamin B_2 in Certain Foods—Previously reported work has established that vitamin B_2 is present both in fresh, unheated yeast and in autoclaved yeast and that cereals are richer in vitamin B_1 than in vitamin B_2 and the reverse is true of milk. This experiment employed wheat and maize kernels since it is alleged that pellagra is more prevalent in the case of maize than in wheat diet. The basal diet consisted essentially of an antineuritic concentrate and casein mixture purified as far as possible to eliminate vitamin B_2 and supplemented by cod liver oil. The cereals were mixed with a basal ration so as to keep the proportion of protein, carbohydrate and fat as 20 : 60 : 15. The cereal modified ration was fed to young rats which had been on a basal diet for 1 week. Comparisons of growth were made in the 4 weeks after the first week on the modified diet. Two different types of whole wheat were tested as well as various portions of the berry. Fifty per cent of whole wheat was required in the diet for sufficient growth. The endosperm is a poor source of vitamin B_2. Wheat embryo and bran are equivalent, 15 to 30 per cent providing sufficient vitamin. Fifty per cent maize in the diet was insufficient for normal growth. The endosperm " grits " are very low in the vitamin but the value of maize as a whole is lower than that of wheat.

Dried ox liver, yeast and fresh whole milk are good sources of vitamin B_2 while dried meat and egg yolk are better than the cereals. There is a discussion of the deficiency symptoms in rats as shown when vitamin B_2 is absent from the ration and this is compared with the black-tongue experiments on dogs and with the "P. P." factor in human beings. All three are assumed to be similar and involve the vitamin B_2 or pellagra-preventive factor.—Wallace Ruddel Aykroyd and Margaret Honora Roscoe, *Biochem. J.*, 23: 483, 1929.

Further Observations on the Effects of Large Doses of Irradiated Ergosterol—Reference is made to the work of previous investigators (abstract this JOURNAL, 19, 10: 1160 (Oct.), 1929) reporting injurious effects of over-doses of irradiated ergosterol and the experiment was undertaken to determine the cause of the formation of the calculi in experimental animals. Rats were placed on an experimental diet consisting of 1 per cent of irradiated ergosterol in cacao butter so that 10 gm. of the completed diet contained 20 mg. of the irradiated ergosterol. Urine was collected from the rats in 3-day periods and analyzed for phosphates, chlorides, and pH value. The rats which maintained a steady food consumption during the control period immediately lost appetite when the irradiated ergosterol was fed. They lost weight for a short period but after this the weight remained constant. The urine output maintained a constant level throughout the experiment but the phosphate excretion varied from day to day and at a high level compared to the control animals. Three days after the administration of the ergosterol diuresis appeared which continued throughout the experiment. The cause of the diuresis is unexplained unless it is due to the marked increase in the calcium excretion. Determination of the chlorides and pH value of the urine during the last days of the experiment showed no differences in these over the controls. After the onset of diuresis the total phosphate remained practically at its previous level with daily fluctuations.—John Clifford Hoyle and Harry Buckland, *Biochem. J.*, 23: 558, 1929.

The Storage of Manganese and Copper in the Animal Body and Its Influence on Hemoglobin Building—In a previous paper (abstract this JOURNAL, 19, 3: 327 (Mar.), 1929) data were presented to show that copper and manganese were effective in hemoglobin formation. This paper presents data to show that manganese and copper may be stored in the animal body. Whole cow's milk supplemented by 0.1 mg. of manganese as chloride was fed to young rats for 5 weeks, after which the manganese was replaced by 0.5 mg. of iron chloride. The second lot for the same period received 0.05 mg. of copper as sulfate, for which 0.5 mg. of pure iron was later substituted. The third lot received 0.5 mg. of pure iron as chloride for the entire period. The first 2 lots showed a low hemoglobin content until the iron supplement was added. The third lot gradually developed anemia but not so rapidly as those without the iron supplement. It is concluded that the animal utilizes a small amount of iron due to copper or manganese stored in the body at birth.—R. W. Titus and J. S. Hughes, *J. Biol. Chem.*, 83: 463 (Aug.), 1929.

Experiments on Nutrition. IX. Comparative Vitamin B Values of Foodstuffs—A number of foodstuffs were examined in this work for the vitamin B (complex), pigeons being the experimental animals. The criterion of vitamin B value was the maintenance of growth for a period of at least 26 weeks. Work has been reported in which the standard for comparison was the hatching and rearing of young which it is

found required a greater amount of vitamin B than for maintenance. The foodstuffs tested were split peas, whole dried green peas, lentils, haricot beans, soya beans, peanuts, almonds ground and whole, hazel nuts, chestnuts, cocoanut, and coffee. Taking as 100 the vitamin B value of 4 per cent of dried yeast to maintain growth for 26 weeks or longer, the various foodstuffs tested ranged by comparison from 20 in the case of peanuts and hazel nuts to 0 in the case of cocoanut and roasted coffee. Green coffee compares favorably with soya beans, lentils, and peas, a comparative value of 13. The remaining products have a value of 10 on this scale. The authors state that at present it is not possible to differentiate the vitamin B complex into its two factors and the results are considered as due to the combination.—R. H. A. Plimmer, W. H. Raymond, and J. Lowndes, *Biochem. J.*, 23: 546, 1929.

Nuts as a Possible Source of Escherichia Coli Found in Candy—Since *E. coli* is used as an indicator of fecal contamination it was deemed worth while to investigate the question of whether nuts might be an indirect source of *E. coli* sometimes found in candy. All the samples were secured in paper boxes or in paper bags as commonly dispensed in the market. Nuts were obtained from a wholesale distributor and from small retail shops.

The presence of *E. coli* was determined by gas and acid production in lactose broth followed by confirmation on Endo medium. The organisms were subsequently identified by further cultural tests. From the wholesale manufacturer of candy 200 samples comprising 10 varieties of nuts were obtained. The colon group, including all aerobic Gram-negative rods producing red colonies on Endo agar and fermenting lactose broth with 10 per cent or more of gas, was found 23 times, or on 11 per cent of the samples. When the members of the colon group were identified, only 4 met the requirements for *E. coli* or *E. communior*, giving a percentage of 2, or essentially the same as was found on previous examinations of candy. Four hundred nuts from retail shops were examined. The colon group was found 86 times, or on 21 per cent of the samples, being twice as prevalent as in the samples from the wholesale store. Only 2 cultures proved to be *E. coli* or *E. communior*, giving a percentage of 0.5. This figure is lower than that found previously from candy and does not support the surmise that the nuts used in certain types of candies are largely responsible for the *E. coli* found. The figures obtained seem to indicate that the *E. coli* found on either candy or nuts comes from the hands of the vendors.—John Weinzirl, *Am. J. Hyg.*, 10: 265 (July), 1929.

Two Outbreaks of Food Poisoning Probably Due to B. Cloacae—During a period of a year and a half, 3 outbreaks of food poisoning, involving a small number of persons in each instance, were reported to the Division of Health of Cleveland. Epidemiologic investigations showed that in each outbreak the food common to all persons was custard puffs from one large bakery concern. The rapid onset of symptoms indicated that the illnesses were intoxications and not infections. Laboratory examination of cream puffs obtained from the houses where illnesses had occurred and of unsold puffs returned to the bakery showed varying results, some being heavily contaminated, some moderately, and others almost sterile. Plate counts of the puffs of the infected lot showed that some contained as many as 68,000,000 bacteria per gm., whereas fresh puffs from 7 other bakeries had counts ranging from 2,000 to 74,000 per gm. No bacteria of the Salmonella group, which are commonly accepted as true food poisoning organisms, were iso-

lated. The flora of the suspected custard puffs consisted of *B. aerogenes* in large numbers, very few *B. coli, sarcina* and many *B. cloacae*. Anaerobic cultures made after heating the stored custard showed no growth. Sterile filtrates of cultures of the organism designated as *B. cloacae,* which was not exactly typical in that it was a slow lactose fermenter and was at first thought to be *B. proteus,* were injected intravenously into rabbits causing marked diarrhea, severe prostration and, in some cases, death. The presence of *B. cloacae* in the food and the demonstration of the ability of this organism to produce thermostabile toxins made it a fairly clear case of poisoning due to this organism. The absence of the usual fecal flora in the puffs together with certain bacteriological findings in and about the cooking room indicated that the ordinary food poisoning group organisms were not involved.

An investigation was made to ascertain why certain batches of custard prepared at this bakery were in good bacteriological condition and caused no illness while other batches contained large numbers of toxic organisms. A chain of circumstances was disclosed involving the practice of placing pans containing the suspected custard on wet floors contaminated with dirt which entered through nearby ventilators, the soiling of the baker's hands from the bottoms of these pans and the use of the unclean hands for scraping the custard from one pan to another. Filtrates of a culture of *B. cloacae* obtained from a ventilator were injected intravenously into rabbits causing symptoms similar to those produced by filtrates from *B. cloacae* cultures from suspected cream puffs. From the epidemiological and experimental data reported showing that an organism of the *cloacae* type was present and members of the paratyphoid group were absent in these outbreaks and that cultures of the organism obtained from the food produced a substance toxic for rabbits, it is concluded that *B. cloacae* was the probable cause of these outbreaks.—Enos B. Buchanan and Emerson Megrail, *J. Infect. Dis.,* 44: 235 (Mar.), 1929.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Milwaukee Next—On June 9, 1930, the biennial convention of the 3 national nursing organizations in this country will open its sessions at the auditorium in Milwaukee, Wis. These 3 organizations are the American Nurses' Association, the National League of Nursing Education and the National Organization for Public Health Nursing.

The Mental Hygiene Section of the biennial promises to be one of the most interesting. Section officers are tabulating answers to questionnaires sent out to state presidents and to state boards of nurse examiners as to the situation in regard to the education of nurses in mental hygiene and psychiatric work.

The mental hygiene program will be especially interesting also, because it follows so closely the First International Congress on Mental Hygiene which will be held in Washington, D. C., May 5–10, 1930. Here will be discussed the relation of mental hygiene to law, hospitals, education, industry, social work,

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

delinquency, parenthood and community problems.—*Bull.*, American Nurses' Association, Oct., 1929.

Vacations and Sick Leaves for Public Health Nurses—In answer to a questionnaire sent out by the statistician of the National Organization for Public Health Nursing to 73 health departments, 72 per cent stated that the yearly vacation given to their nurses was two weeks. Of the 99 public health nursing associations questioned, all but 7 per cent stated that one month was the vacation time given their nurses.

The most frequent length of time allowed nurses in a year for sick leave with full pay by health departments, school boards and public health nursing associations was found to be 2 weeks.

Out of 128 boards of education employing nurses, 63 per cent of these in cities of 100,000 or more population require their nurses to work on Saturdays. Only 20 per cent of the boards in cities under 100,000 require their nurses to work on Saturdays.—Louise Tattershall, Pertinent Facts Relative to Salaries of Public Health Nurses, *Pub. Health Nurse*, V, XXXI: 444–445 (Aug.), 502–503 (Sept.), 1929.

(NOTE: Further reports of the results of Miss Tattershall's studies along this line will be published in other issues of *The Public Health Nurse.*)

Hygeia Helps the Public Health Nurses—In the November, 1928, issue of *Hygeia*[1] there was a health-score outline for teachers which was worked out by the Committee on Hygiene and Physical Education of the Massachusetts Federation of Teachers' Clubs. This score was divided into two sections: I. *Signs of Health*, under which there were 17 items, and II. *Health Habits*, with 24 items.

Several public health nurses in Indiana used this score to good advantage at the beginning and end of their hygiene classes in high school, to measure the improvement in health habits and health of their students during the school year.

One school nurse who was asked to talk before the Lion's Club at a noon luncheon made mimeographed copies of the score and distributed them to the men, who scored themselves at the meeting and were very enthusiastic about it.

Another public health nurse distributed the score sheets at a Parent-Teacher Meeting and created a very deep interest in everyone present. There was great surprise that a visit to the dentist twice a year counted 40 and a thorough physical examination once a year counted 50 towards the whole possible score of 530.

In the October, 1929,[2] issue of *Hygeia* there is a score outline for the home in regard to sanitation, communicable disease control, child hygiene and health education. And this, too, ought to be widely used by the public health nurses in interpreting the health needs of the household in a practical and interesting way to either individuals or groups.

REFERENCES

1. Andress, J. Mace, Health and the School Section, *Hygeia*, 651 (Nov.), 1928.
2. Lane, Edward A., Scoring Your Domestic Health Service, *Hygeia*, 993 (Oct.), 1929.

County Nurses and the Conveyance of Patients—Nannie J. Minor, R.N., Director of Public Health Nursing for the Bureau of Child Health, Virginia State Board of Health, has been making a study in her state as to how much time and money the county public health nurses are spending in the conveyance of patients to sanatoriums and hospitals. She states in her questionnaire sent out to the nurses, "We are seeking for information, with a desire to clarify as far as possible the multiplicity of duties which are constantly being heaped upon the health worker and which could be done just as well by other people." Forty-six nurses replied. The questions which applied only to the past 6 months are given below with their answers:

1. How many times have you personally conveyed a patient to a sanatorium in your car?

37 replied no patients
1 " 1 "
3 " 2 "
1 " 5 "
1 " many times

2. How many times have you personally conveyed a patient to a hospital?

14 replied no patients
11 " 1 "
2 " 2 "
2 " 3 "
4 " 4 "
1 " 5 "
1 " 9 "
1 " 10 "
1 " 11 "
1 " 12 "
1 " 50 "
1 " 130 " or an average of 5 or 6 a week
1 " 288 " to clinics
1 " many times
1 " 2 patients—taken on train
1 " 1 patient—taken on train
2 " not clear, as only in an emergency

3. If it means some distance, why is the car preferred over the train?

20 did not reply
7 said patients taken if the distances were short
1 reported poor train service
3 reported when patient was very ill there were no funds
3 stated distances longer by train
6 stated no train service was available
2 stated less time and less expense
3 stated several patients could go at once at less expense and greater comfort
1 stated train was always used

4. What has been the approximate expense of such trips and about how much time was consumed by the worker?

28 did not reply
The remaining 18 varied from 75¢ to $10.00
23 did not reply as to the amount of time spent
The remaining 23 gave time from ½ hour to 32 hours

5. Why was it necessary for the health worker to accompany the patient?

22 did not reply
The answers of the remaining 24 are rather interesting
1 stated "part of my work"
4 stated "friends and relatives do not understand how to manage nor how to get reduced rates at the hospital"
1 replied "information health worker can supply"
2 replied doctor requests nurse to go
7 replied no other person available
9 replied patients dangerously ill—no funds available

6. Do you think that such activities have any place in your work?

28 stated that frequently it helped popularize the work
15 replied "no"
3 failed to reply

The study does not show how many of these visits were repeated for the same patients. Many nurses make it a rule to take the patient to the hospital or sanatorium or clinic, as the case may be, for the first time in order to answer questions about his history and social conditions, and this often aids greatly in the solution of his problems and in his improvement or final recovery. She in turn can convey the information and the advice given at the hospital or sanatorium or clinic to the patient's physician and family at home. In emergency cases she is often the only one available for quick action—here mobilization of volunteers might cause dangerous delay. But to accompany chronic patients week after week to hospitals for treatment, surely wastes a nurse's valuable time and she ought to make some arrangement for volunteers to do it.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

The Harmon Awards Next—The most important opportunity this season for recognition of good health education publicity is offered through the Harmon Foundation awards for a Year's Publicity Record—$100 each is offered for the best record submitted by a national agency, a state or regional agency, a city or county agency of 200,000 or more population, and a city or county agency—under 200,000 population.

The conditions are simple. The making of such a record should be extremely valuable to any alert health agency—well worth while even though the prize is not won. We hope that all health agency entries can be exhibited at the 1930 meeting of the A. P. H. A. The Harmon Foundation, 140 Nassau Street, New York, N. Y., will gladly send the conditions. Will you ask for copies to be mailed to all health organizations in your city, county or state? Nationals are invited to distribute copies and to urge their local groups to enter the contest.

Local and State Health Education Councils—Why not get together locally and in connection with state health and social work conferences? Four or five local luncheon or dinner sessions this season, and a session or two at the next state meeting, should do much in boosting interest and effectiveness in public health education. Merely to talk over whatever anyone in the group has on his mind would be worth while. Submit copies of your material for informal comment. Invite the presence of a printer or a newspaper man and ask him questions about your material. Set up any one of scores of questions or problems and see what the group has to contribute. Appoint a chairman and a secretary to plan and call the next meeting.

What group will announce that they are getting together?

The Yard Stick—

To ascertain the "subject matter" for publicity work in a health department I have drawn up a guide based on the appraisal form of the American Public Health Association. After keeping in close touch with department heads for more than a year to make the publicity keep in step with their activities and perhaps get out in front once in a while and stir things up for them, I found that department activities aimed to make up shortcomings pointed out in local health work when the appraisal form yardstick was applied to our program. Consequently, to find the "subject matter" for publicity it was only necessary to set aside activities in which points were lost in getting our rating. For instance—we lost 11 points because not enough pre-school children visited clinics. Therefore, more publicity for pre-school clinics. We lost 4 points because of lack of nutrition work. Therefore, more publicity for nutrition work. Good copy is available because the publicity man knows the health department's program is in step with his own.

—George A. Dundon, Director of Health Education, Health Department, Milwaukee, Wis.

EXHIBITS

Practical suggestions for taking part in the fair are continued in these articles: "Babies Rest at the Fair," "First Aid Tent," "Some Suggestions for Health Exhibits," "During a Community Chest Drive," "What Not to Do in County Fair Exhibits." *Pub. Health Nurse.* Aug., 1929.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

"The Diphtheria Prevention Commission has prepared twelve attractive panels as a technical exhibit on the prevention of diphtheria. This set is intended primarily for health officers in showing the way to a coördinated community campaign to wipe out diphtheria. Each panel is 32 by 43 inches. The backgrounds are appropriate designs on which are superimposed the forms used by the Commission in its work in New York." Application for the loan of the exhibit may be made through Edward Fisher Brown, Director, Diphtheria Prevention Commission, 505 Pearl Street, New York, N. Y.

A health exhibit won a first prize of $100.00 at the Tompkins County, N. Y., Fair, and will be shown at the county fairs in the state. Planned by Nina V. Short of the staff of Tuberculosis and Health Committee, S. C. A. A., the exhibit was designed to present the county health department services. The exhibit shows in miniature the court house and clinics, with an attractively painted background.

The historical exhibit at the recent National Tuberculosis Association exhibit, Atlantic City, N. J., suggests possibilities for other groups. The "antique" publicity section might be worked out in connection with the 1930 meeting of the A. P. H. A. It would help to show progress made in educational materials.

"How Pasteurization Safeguards Your Milk Supply"—*N. E. Journal of Medicine.* Jan. 24, 1929. *Monthly Bulletin,* Board of Health, Fall River, Mass. July, 1929. Issued as a leaflet by Mass. Dept. of Public Health. *Free.* Effective thermometer diagram—good for exhibits and printed matter—with text answering "What Is Pasteurized Milk?"

Models of two houses in neighboring lots represented "the house of good health" and "the house of ill health." The house of good health was shown on a plot with a green lawn, split peas being used for grass. The foundations of the house were made of zwieback, the material of the walls and chimney were layer-figs, the roof, graham crackers, awnings were of orange peel, the doorstep and the walk of triscuit. Trees were of celery in a tomato setting, the stiff shrubbery was represented by carrots and the children on the grounds were made of dates. The house of ill health appeared set in a grass plot of coffee giving the appearance of a drought. The garden walls were of lump sugar, and the house itself was of coffee stucco. A granulated sugar walk and cake steps led to it. The children were made of various kinds of highly colored candies.

—*Health News,* N. Y. State Dept. of Health. July 8, 1929. This exhibit was recently prepared for the Health Dept., Glens Falls, N. Y. A well-done revival of an idea in use for several years. Its educational value depends upon the talk by a good explainer who will make obvious the difference in the food values in the materials used in the two houses. Standing alone, will the exhibit be much more than a curiosity?

Pictures of a "Health House" exhibit at the Rochester Exposition appear in *Bulletin,* Tuberculosis and Health Association, 35 Chestnut St., Rochester, N. Y., July, 1929. *Free.* The barker invites visitors in with

Come on, folks, right this way to Healthy House. Everything free. Won't cost you a cent. Everybody Healthy—that's what we want—step right in. See the poor little white rat that never drank any milk. See the three bears who sleep in their own separate beds, eat hot cereal and walk every day in the open air just as Goldilocks discovered them. Get a ticket for the anti-toxin express train for No Diphtheria Town. Have the baby weighed—yes, we have pretty nurses who weigh all the babies under six. . . .

"Popularizing Prenatal Education," by Helen Albano. *Trained Nurse and Hospital Review.* June 29, 1929. Pp. 789–791. Describes in detail a department store demonstration of home confinement. Diagrams and pictures show the arrangement of objects in the demonstration space.

HEALTH SUPERSTITIONS

"Folk Doctoring." *Public Health*, Central Board of Health, Kingston, Jamaica. Aug., 1929. "Did he ever kick the cat? That's one of the causes for joint rheumatism."

"Toothache's Place in History." *Sunday World Magazine*, New York. Sept. 1, 1929. *10 cents.* Charms, whiskey, apples and other "cures."

Ancient and modern health superstitions should make good copy for the Sunday newspaper. And there are plenty of them now current.

NEWSPAPERS

In the 1929 "Feature Story Contest" of the Social Work Publicity Council a first prize was awarded Dwight Anderson, National Tuberculosis Association, for his story, "Roentgen Ray Lights Way in War on Plague." Said the committee: "This story is historically and scientifically informative and yet retains the breeziness and crispness of expression so essential to successful newspaper work."

The award of a medal to Dr. Ernest Fuchs, of Vienna, was used as the lead of a press release to announce the reelection of a president of the National Society for the Prevention of Blindness —the latter event in itself not of widespread newspaper interest. Released July 29, 1929. *Free.*

"Questionnaires as a News Source" quotes the publicity department of the National Board, Y. W. C. A., on questionnaires as supplying material for news copy which can be given an educational slant. See *News Bulletin*, Social Work Publicity Council, 130 East 22d St., New York, N. Y., Sept., 1929.

Questions about health habits, health beliefs, what people know about health departments or other health agencies, reading on health topics, and so on, can be handled by mail, at meetings, with individuals, and among special groups. As a rule statements of results will be welcomed by editors and appeal to many newspaper readers who would not be attracted by paragraphs discussing the unadorned subject matter.

Attendance figures at Massachusetts state cancer clinics, as discussed by *New Bedford Standard*, show that

> in the state as a whole 45.2 per cent of those who reported to a clinic were led to do so by what they had read in the papers. . . . In New Bedford the percentages for newspapers, doctors and friends were 56.8, 21.1 and 12.1, respectively. . . . In New Bedford 22.5 per cent of those attending were found to be suffering with cancer. . . . If they are cured, the clinic has accomplished a wonderful thing, and in bringing this about intelligent newspaper publicity has been an important factor.

"Annual Directory of Features," in *Editor and Publisher*, Times Bldg., New York, N. Y., Aug. 31. *10 cents.* Lists features supplied by syndicates to newspapers, feature and picture syndicates, news services, photographic services, mat and cut services, syndicate writers and artists.

"Health columns" supplied by newspaper syndicates are written by the following: Dr. M. Schuman, Dr. Lulu Hunt Peters, Dr. Frank McCoy, Dr. Logan Clendening, Dr. W. A. Evans, Dr. Morris Fishbein, Josephine Huddleston, Bernarr Macfadden, Dr. Herman Bundesen, Dr. McCoy, P. J. Veatch, Dr. Royal S. Copeland, Leon F. Whitney.

TO CATCH THE EYE

Distinction can be given to mail by the use of large postage stamps. The following two-cent stamps can be bought through Philatelic Agency, City Post Office, Washington, D. C.:

Valley Forge (1928)
Aeronautic Conference (1928)
Burgoyne Campaign—Saratoga (1927)

The Burgoyne stamp is small, but unusual. Two-cent Sesquicentennial envelopes in 3 sizes are quite different from the usual ones. *Send for order blank.* But try your local post office first.

An example from the colored picture map on cover of "Radburn Garden Homes" may suggest use of a similar graphic device to indicate the location of a health activity, the community served, etc. This particular pamphlet describes "a new safety street plan" and other ideas on new housing developments. City Housing Corporation, 18 East 48th St., New York, N. Y. *Free.*

"Just What Is a Poster Anyway?"—A poster is to the eye what a rallying cry is to the ear. It is to sight what a crusader's slogan is to sound. A poster has something to say, and says it hard. It has no patience with negative virtues. Its aim is to get things done. It runs on a single-track line of thought. Through the eye of the beholder, its singleness of purpose and its sincerity must be instantly and wholly comprehended.

—From "How to Make a Poster," in *"Seeing Is Believing."* American Child Health Association, 370 Seventh Ave., New York, N. Y.

WHAT WE FOUND IN SOME HEALTH BULLETINS

"A Dental Health Exhibit as a Project in Health Education" is described by Pearl E. Wilson, R.N., director dental health education, State Department of Public Health, Oklahoma, in *The Public Health Nurse* for September, 1929.

"Health Education in Teachers' Training Schools" is a report on a five-year study at the New York Training School for Teachers by Iago Galdston, M.D., secretary, health education service, New York Tuberculosis and Health Association, New York, N. Y. It contains an outline of the curriculum of health education course given at New York Training School for Teachers. Copies may be ordered at 50 cents each from New York Tuberculosis and Health Association, 244 Madison Avenue, New York, N. Y.

Wanted, an Author—"Who will be the Emily Post of Public Health?". The U. S. Public Health Service has coined the term "Sanitary Etiquette" and suggests that somebody write a book about it, called "The Hygiene of Etiquette," to teach prophylactic measures and practical hygiene as well as social courtesy. Some of the unhygienic indiscretions to be barred by the contemplated volume are coughing and sneezing without protecting the mouth, indiscriminate kissing, insistence upon hand shaking, blowing the nose on a soiled handkerchief, later used for other purposes; moistening various articles, such as money, books, tickets, etc., with saliva are also deprecated.

—*Clip Sheet,* N. J. Tuberculosis League, Inc., 21 Walnut St., Newark, N. J.

We think this is good—A radio talk that is easy to listen to is quoted below: "When you or some one in your family wakes up in the night with a terrific pain in the stomach, a high fever, a sudden chill or something else and you want a physician badly, it is comforting to realize that you have a family doctor. You ring him up on the 'phone, perhaps you call him by his first name, and very shortly he is at your side. With his entrance into your home there is immediately a sense of relief because you know and have confidence in your doctor. Besides this he knows from previous visits in the home the health and sickness background of each member. The doctor quickly sizes up the present situation and takes command and you follow confidently his advice and instructions.

"Picture, if you will, this same urgent need in a family that has no regular doctor. The first question to decide is who to call. Should it be a stomach specialist, a throat specialist, a surgeon or a general medical man? When this is decided upon the telephone is put to use. The responses may be varied but often unsatisfactory. 'I go out at night only for my regular families.' 'I limit my work to nose and throat work,' or, 'I am just going out on another case; try Dr. Blank.' Finally you are successful in getting someone to respond to your appeal and he arrives, a stranger in the home. You look him over and are not quite sure just how much confidence you

should place in him and he is sizing up the situation to see whether he is likely to get paid for being pulled out of bed. The physician has to ask a lot of questions to get the history of the case and then he proceeds to his examination, an unknown doctor for an unknown patient. He may recommend immediate hospitalization, an operation, or come to the conclusion that a cathartic is all that is necessary. You probably follow his advice no matter what it is but you cannot help but feel a little uneasy about the matter.

"Every family that can afford it should have a regular physician. This physician should see the family every year whether there is sickness or not. He should be asked to do physical examinations on everyone annually and give proper advice for the prevention of disease and the care of defects. Occasionally one hears the remark, 'We haven't had a doctor in our house for five years and wouldn't know who to call if there was sickness.'

"As a rule families have their own grocer, banker, and spiritual adviser, etc., but too frequently the family physician is neither chosen nor made use of until late in the contest between health and sickness."—Have You a Family Doctor? in *Health*, published by the New Haven Department of Health. July, 1929.

Sometimes we enclose a printed card with reports and other special publications when sent to certain lists. As an inexpensive substitute for the printed card Bellevue-Yorkville Health Demonstration has used a stock 3 x 5 card on which was multigraphed "With Compliments" followed by the name and address in the center, and the name and title of the executive at the lower right corner—the Demonstration title and executive's name all in caps.

"The Attention-Getting Phrase in Your News Lead" (*News Bulletin*, Social Work Publicity Council, June, 1929) quotes from Dwight Anderson a list of phrases for the opening sentence, the "lead," of newspaper stories, accompanied by the news element out of which each phrase grows. Examples: "Aroused by—," "Seeking to avert—," "To ascertain why—," "Final action on—." A valuable list for desk use.

"Which Way Publicity?"—This question is raised in a lively fashion—and answered with a bang by Leigh M. Hodges. *Survey*, 112 East 19th St., New York, N. Y. July 15, 1929. *25 cents.* Although addressed to child welfare agencies its sharp thrusts will pierce the armor of all but the hopelessly self-satisfied, and unwilling-to-learn health workers.

REQUEST FROM LONDON

The following comes from T. Crew, organizing secretary, Central Council for Health Education, 1 Upper Montague Street, Russell Square, London, W. C. 1, England:

> The Central Council is coördinating the various health associations in this country and also preparing a Museum of Health Propaganda in order to be of service to the medical officers of health and others engaged in public health services, etc.
>
> The Council would be glad if you can kindly supply them with any health posters and health leaflets, etc., for display in our Museum.

IN THE MAGAZINES

"Eat, Drink, but be Wary," by R. S. Copeland, M.D. *Collier's*, July 13, 1929. Germs and refrigeration.

"Get a Mouthful of This," by Ruth F. Wadsworth, M.D. *Collier's*, Sept. 28, 1929. Tooth decay: Why? Why not?

"Mechanized Medicine." Editorial. *Sat. Eve. Post*, Sept. 7, 1929.

"Vitamins in Margarines," by E. E. Slosson. *Collier's*, Aug. 24, 1929.

BOOKS AND REPORTS

A History of the Medical Department of the United States Army—*By P. M. Ashburn, Colonel, Medical Corps, U. S. A. Boston: Houghton Mifflin,* 1929. 448 pp. Price, $5.00.

Every present and former member of the Medical Department of the U. S. Army ought to read this book, which is the first comprehensive and satisfactory history of this extremely important branch of our military forces. Officers of the active services and of the organized reserves ought to receive credit for doing so, not because the book is hard reading, for, though lengthy, it is the reverse. The struggles and vicissitudes, the achievements and triumphs of our medical soldiers, as described and occasionally commented upon by Colonel Ashburn, who is exceptionally well qualified for this task, are always interesting and frequently entertaining and instructive.

The story begins with the hectic days of 1775 and spans the whole career of the service up to 1928. The first part, dealing with the period before the Spanish-American War, is, of course, compiled entirely from available records and so lacks some of the verve of the later sections, such as those on the World War, when the author could draw for his facts on personal experiences as well as authentic records. While the book gains momentum as it progresses, this is no disparagement of the earlier parts.

The account is an impartial one, with no attempt to gloss over some of the less creditable incidents in the history of the Medical Department, such as the lack of preparation and of efficiency in the early years of the Civil War and more or less throughout the Spanish-American conflict. At times some of the quotations from old documents seem a little prolix, and the informed reader will not always agree with the author's evaluation of personalities and events. Members of the Sanitary Corps will also be disappointed at finding so little about this branch of the department which rendered such valuable service during the World War.

Despite these minor defects, if they are shortcomings, this well-printed book is a notable contribution to medico-military literature. It fulfills a real need and deserves a wide circulation. There is an introduction by Surgeon General M. W. Ireland and a number of useful appendices, including a well-merited appreciation of Surgeon General Ireland, contributed by General Pershing.

JAMES A. TOBEY

The Child's Heredity—*By Paul Popenoe. Baltimore: Williams & Wilkins,* 1929. 316 pp. Price, $2.00.

The author has the happy faculty of making this rather heavy subject interesting and at times even entertaining, not only by choosing good material and language but also, when perhaps his reader may be a bit weary, by telling him that: "Some youths have asserted that all blondes are fickle and all brunettes inconsistent. It is not a given type of complexion, however, but sudden change from one type to the other, that is properly to be considered as an evidence of instability." Other illustrations *are* apropos and not simply amusing.

The author, we think, must possess an ancestry of several millions—or less—of generations of Presbyterians, so strong does his belief in predestination and the inevitability of results from given forebears appear; yet we imagine that had he been employed as counsel

by the proponents of environment as the dominant factor in child development, he could and would have found enough variables to leave his readers, who have but mediocre prospects from heredity, some hope through training.

Parents will find this book a good one to add to their general cultural knowledge and we trust that many will read it, but the preface says: "This is a guide book for parents. Their interests and practical needs have determined the selection, the arrangement and the treatment of the material," and yet about all the "guidance" we find is contained in nearly the last line where the author says: "The greatest opportunity a man ever has to exercise this choice [of conditions favoring race evolution] is in the selection of a set of genes to add to his own for the creation of children."

The book contains good reliable material well arranged and is an excellent presentation of the subject from the angle of major emphasis on hereditary influence. W. D. LUDLUM

Health Science and Health Education for College Students and Teachers in Training—*By W. Alfred Buice. New York: Wiley,* 1929. 344 pp. Price, $3.00.

This is an effort to combine personal and community hygiene. The book is divided into four parts—part I dealing with preventable diseases and how they may be prevented; part II with personal hygiene and efficiency, including a chapter on reproduction and sex hygiene; part III relating to such community health factors as milk safety, child conservation, public health administration, and the public school health program; part IV is made up of projects and exercises for class use, and of first aid exercises. There is also an appendix on nutrition, offering standard dietaries for persons of different weights and activities, and fattening diets for those needing them.

Part IV offers a wealth of project material and suggestions which teachers in training may use later in their own teaching.

The text is designed for the use of college students and teachers in training. The material is well organized, sufficiently illustrated, and clearly stated. Supplemented by the projects and exercises of Part IV, this work makes an excellent text for the designated group. A worth while book in a field, particularly as regards teachers in training, that needs emphasis. C. H. KEENE

The New Healthy Living—*By Charles-Edward Amory Winslow, Dr.P.H., and Mary L. Hahn. New York: Merrill,* 1929. Book I. Price, $.84. Book II, 438 pp. Price, $1.00.

In Training for Health—*By C. E. Turner, Dr.P.H., and Jeanie M. Pinckney. Boston: Heath,* 1929. 151 pp. Price, $.72.

Science and the Way to Health—*By J. Mace Andress, Ph.D., and Maud A. Brown, M.S. Boston: Ginn & Co.,* 1929. 367 pp. Price, $1.00.

Sanitarians will want to know about this summer crop of school health readers. They will be interested, not so much in the relative merits of each, but in the fact that those most competent to guide the school child's hygienic life are putting themselves to the task of preparing good books.

Of the 4, 2 are for youngsters of about the fourth grade, and the others for boys and girls in the junior high grades. All are written for children who are presumed to have had some health instruction.

Obvious analogies between training for athletic success and training for life, inspirational stories about well-known persons who have achieved the healthy life despite a poor start, interesting tales of "microbe hunters," and curiosity-stimulating accounts of our internal processes all go to make the books good,

as well as helpful reading for the youngsters.

To a reviewer old enough to have suffered under the old régime of so-called health teaching, yet not so old as to have forgotten the deadly dull physiologies of his own school days, the perusal of this series of health readers is indeed a pleasant assignment. Vivid still are the memories of the 208 dry bones whose fiendish names had to be learned by rote. I can still see myself standing limply in the aisle reciting with utter boredom, ". . . and the bones of the arm are the femur and the ulna . . ." and so on *ad nauseam.* The memory of the names and uses of the countless muscles happily is clouded by the merciful mists of forgetfulness.

R. S. PATTERSON

Readings in Public Opinion. Its Formation and Control—*Edited by W. Brooke Graves, Ph.D. New York: Appleton,* 1928. 1281 pp. Ill. Price, $6.00.

The editor, professor of political science in Temple University, has accomplished a colossal piece of work; i.e., compiled a volume of nearly 200 essays and discussions on the various subjects that are related to the formation and control of public opinion.

In his introduction to the volume, Clyde L. King, Ph.D., professor of political science, University of Pennsylvania, takes up the importance of public opinion and its distinguishing elements.

The first section of the book is more or less analytic, for the editor has grouped contributions dealing with the formation of public opinion, the rôle of discussion in its formation, the nature of group opinion as contrasted with general public opinion, the scope of public opinion, how it is influenced by environmental and hereditary conditions and its power in the community.

According to the editor's analysis, as brought out in his plan of presentation, there are certain established social institutions which influence public opinion. They are all familiar to the reader—the school, church, press, theatre and motion pictures, art, literature, music, the radio, and oratory—and here he especially deals with the Chautauqua.

The private organizations that influence public opinion are the public relations counsel, chambers of commerce, corporations and organized labor, trade associations and civic and improvement associations. One chapter is devoted to racial influences.

Then there is the governmental influence—the appeal of the reformer, the demagogue, the leader and the political party and legislation leadership. Included in this volume are articles dealing with lobbying, freedom of speech, censorship, the administration of justice, international public opinion and public opinion in war time.

This volume is a valuable aid to the publicist or the student of human behavior. Although it was probably not compiled with the idea of offering a textbook on the subject, the author has placed at the end of each section topics for further investigation and discussion.

Two indexes—author and subject—are also commendable features of the book. It is sparsely illustrated with cartoons.

This is an excellent volume to have handy on the bookshelf for reference and ideas. ANNE TOWSE

Outline of Preventive Medicine. *For Medical Practitioners and Students. Prepared under the Auspices of The Committee on Public Health Relations, New York Academy of Medicine. 21 Contributors. Editorial Committee: Frederic E. Sondern, Chas. Gordon Heyd, and E. H. L. Corwin. New York: Hoeber,* 1929. 398 pp. Price, $5.00.

This book can at least claim to have been written on a different plan from

other works on preventive medicine. Whether or not it is a good one is open to considerable question. Instead of beginning, as most books on the subject do, with some description of the formation and functions of the body, it goes at once into "The Periodic Health Examination," and then one by one, different specialties, such as obstetrics, pediatrics, dermatology, etc., are discussed by specialists in each particular line.

Written as it is by 21 different authors, it has some of the faults inherent in such productions. In the section on General Medicine, for example, we find no mention of the Dicks' work on scarlet fever, of the recent discoveries in regard to yellow fever, nor of the work of Birkhaug on the particular streptococcus which causes erysipelas, though the leucocytic extract of Hiss is mentioned. The other sections of the book do not entirely make up for these omissions, though the Dick Test as well as the use of streptococcus toxin for immunization is mentioned in the section on pediatrics.

The chapters are each well written, and contain a fund of useful information, though practically all of them presuppose some knowledge on the part of the reader. We believe that the omission of fundamentals detracts from the general value of the book, which is otherwise of high quality.

The printing and make-up of the book are excellent. M. P. RAVENEL

Chemistry of Daily Life—*By Samuel Glasstone. New York: Dutton,* 1928. 250 pp. 21 diagrams. Price, $2.25.

This book is the result of a course of extension lectures given at Plymouth under the auspices of the Education Authority and of the University College of the South-West, Exeter, and of a series of radio talks by the author on the same subject. It is intended for the general reader, and to serve as a basis for extension and similar lectures as well as a textbook for schools whether chemistry is taught or not.

Twenty-two chapters and an index cover 250 well-printed pages, dealing with such subjects as the history of chemistry, structure of matter, air, water, carbon, burning and breathing, flame and explosion, foods, catalysis and enzymes, plants and soils, fuels, metals and alloys, the laboratory in reference to synthesis of dyes, medicines and perfumes, and artificial foods and clothing.

A very valuable feature of the book is the list of questions, suggestions and references to literature that follows each chapter. By the use of this list even the general reader can be led into a definite and systematic study of chemistry.

The beginning student would profit by a more definite consideration of the chemical equation together with the inclusion of a few pages with reference to chemical calculations. An equation, whether chemical or otherwise, is something of a mystery to the initiate; so a little assistance in this regard would go a long way. But this item aside, the book under consideration is one of the best of its kind. C. F. ADAMS

Home Care of the Sick—*By Norma Selbert, R.N. Philadelphia: Saunders,* 1929. Price, $1.00.

Based on a wide experience as a nurse, an extension lecturer and a teacher of public health, the author has given us an excellent book of practical instruction in non-technical language suitable for use in every home. The author's duties have taken her into homes of all kinds, from those of the rich city dweller to those living in remote agricultural districts. She is therefore exceptionally well fitted to judge of what is needed and has given this in a concise and readily available form. She has covered the ground in an excellent fashion.

M. P. RAVENEL

Sunrays and Health—*By Ronald Millar in collaboration with Dr. E. E. Free. New York: McBride,* 1929. 125 pp. Price, $1.50.

The rays of the sun are at last enjoying the popularity of a best seller. They have become the fashion. Clothing designers having put the seal of approval upon them they have a recognized standing. Old-fashioned people who have always appreciated the sunshine may now feel themselves for once quite in style. Furthermore they may find out the scientific basis for belief in the powers of sunshine by reading the well-written little book called *Sunrays and Health* by Ronald Millar and Dr. E. E. Free.

Part of this book is devoted to a simple explanation of the composition and properties of sunlight and the part that the ultra violet element plays, especially in relation to the human body. The geographical distribution of ultra violet is taken up. We find that a place in the sun in New York City is not of much value from November to April so far as getting one's share of ultra violet is concerned. A useful list of window glass substitutes is quoted with figures indicating the percentage of solar ultra violet these substitutes may be expected to transmit.

The ultra violet lamp, however, seems to be the climax toward which the book works. Evidently the authors consider this a wonder-worker. A note of half-concealed criticism is seen, levelled at the conservative attitude of the American Medical Association for frowning on the advertising of generators of ultra violet energy to the general public. Nevertheless the quotation from an article by the brother of the inventor of the mercury arc lamp, although apparently intended to reassure prospective users of "artificial sunlight," seems on careful reading to be far from reassuring.

For the intelligent reader accustomed to taking all his reading with a grain of salt this little book will prove both informative and entertaining.

MERRILL E. CHAMPION

Laboratory Manual of the Division of Bacteriology, Peking Union Medical College—*Prepared under the direction of D. E. Lim. Peking, China: P. U. M. C. Press,* 1929. Price, $1.50.

From China comes this excellent laboratory guide, printed in English by the College Press. The directions are clearly given, and the book in general is admirably adapted to the purpose for which it is intended.

At the end of each section, the references are given, so that the reader may consult the more complete text.

Two omissions are noted. There is no mention of Ponder's stain for diphtheria bacilli, which, in our experience, is by far the best, especially for direct smears, nor of Dorner's spore stain.

The book is well printed and made up.

M. P. RAVENEL

Selected Readings in Pathology. From Hippocrates to Virchow—*By Esmond R. Long. Baltimore: Charles C. Thomas,* 1929. Price, $4.00.

The author has selected from the literature of the past what he considers some of the most important contributions to the science of pathology. What the original writers said of their work is given in their own words, or as near to them as a good translation can come.

What has been given is beyond criticism, and we believe that the selections have been made with excellent judgment. The author deserves the thanks of students and teachers alike for making this material readily available.

The make-up of the book deserves special mention. It comes from the new publishing house of Charles C. Thomas. It is a beautiful book which

will be an ornament to any library, and its material is of rare interest. The illustrations are numerous and good. A page in the rear gives the story of its making. M. P. RAVENEL

Heredity and Parenthood—*By Samuel C. Schmucker. New York: Macmillan,* 1929. 322 pp. Price, $2.50.

The major portion of this book is devoted to the presentation of the biology of reproduction, from the simplest forms up to and including the mammals. This is expressed simply and demands no previous knowledge of the subject and is appropriate to those interested people who have lacked the opportunity of a high school education or more. The reviewer suspects that the subject has not been adequately covered in all high school or college programs even in the present day.

A few of the later chapters are devoted to the relations of the sexes in childhood, youth and early adult life, and the subject and form of sex education; the author's children, then eleven and nine years old, having received a large slice of instruction in connection with the puppies, born by prearrangement, in the house.

The author is deeply religious, with a God who produces creation by evolution. He believes in ample sex education through biology; in early marriage at the proper physiologic age to avoid the errors of delay. He approves of birth control, and of the wife contributing to the family budget, as may be necessary, for a while after marriage.

Altogether we might call him a "Victorian modernist," with the good traditions of that age, modified by modern science and economic necessity.

The title of the book is a misnomer; heredity—inheritance of characteristics, physical or mental—is barely referred to, and parenthood only in the manner mentioned above.

However, this title may achieve the desired effect of attracting the readers he wants. WALTER D. LUDLUM

BOOKS RECEIVED

MUNICIPAL ORDINANCE MAKING. By Harvey Walker. Columbus: Ohio State University Press, 1929. 207 pp. Price, $3.00.

STERILIZATION FOR HUMAN BETTERMENT. By E. S. Gosney and Paul Popenoe. New York: Macmillan, 1929. 202 pp. Price, $2.00.

PATHOGENIC MICROÖRGANISMS. 9th ed. enl. and rev. By William Hallock Park, Anna Wessels Williams and Charles Krumwiede. Philadelphia: Lea & Febiger, 1929. 819 pp. Price, $6.50.

THE CHEMICAL ASPECTS OF IMMUNITY. 2d ed. enl. and rev. By H. Gideon Wells. New York: Chemical Catalog Co., 1929. 286 pp. Price, $6.00.

THE FUNDAMENTALS OF BACTERIOLOGY. 4th ed. By Charles Bradfield Morrey. Philadelphia: Lea & Febiger, 1929. 347 pp. Price, $3.50.

HUMAN NATURE AND MANAGEMENT. By Ordway Tead. New York: McGraw-Hill, 1929. 312 pp. Price, $3.50.

THE BEHAVIOR OF YOUNG CHILDREN. By Ethel B. Waring and Marguerite Wilker. New York: Scribner, 1929. 121 pp. Price, $1.00.

A NEW WAY TO HEALTH. By Ralph Collier Wright. Boston: Christopher Publishing House, 1929. 131 pp. Price, $1.50.

A STUDY OF MASTURBATION AND THE PSYCHOSEXUAL LIFE. By John F. W. Meagher. 2d ed. New York: Wood, 1929. 130 pp. Price, $2.00.

APPLIED ELECTROCARDIOGRAPHY. By A. E. Parsonnet and A. S. Hyman. New York: Macmillan, 1929. 206 pp. Price, $4.00.

MEDICAL INFORMATION IN SICKNESS AND HEALTH. By Philip Skrainka. New York: Coward-McCann, 1929. 577 pp. Price, $7.50.

SOME METHODS FOR THE PREVENTION OF TUBERCULOSIS. By W. Bolton Tomson. New York: Wood, 1929. 148 pp. Price, $2.50.

AIDS TO ZOOLOGY. By Harry Lister. New York: Wood, 1929. 214 pp. Price, $1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Possibilities in Life Conservation—Causes of death grouped by age and sex are shown graphically and the presentation is used as a basis for a discussion of possible preventive measures.

ANON. Where Can Lives Be Saved? Weekly Bull. (New York City Dept. of Health), 18, 34: 265 (Aug.), 1929.

Postvaccinal Encephalitis—Briefly summarizing the prevailing opinion in regard to the possible causes of postvaccinal encephalitis. The preventive measures suggested are avoidance of vaccination in areas where polio and encephalitis are present, use of "American" method of vaccination, and vaccinating during the first year of life.

ARMSTRONG, C. Postvaccinal Encephalitis, Pub. Health Rep., 44, 34: 2041 (Aug. 23), 1929.

Measles Prophylaxis—Another report of the benefits derived from the use of convalescent blood as a preventive of measles.

BADER, G. B. The Intramuscular Injection of Adult Whole Blood as Prophylactic Against Measles. J. A. M. A., 93, 9: 668 (Aug. 31), 1929.

When is an Epidemic?—This delightful dissertation on the relative merits of knowing what to do and how to make the public believe you are doing the right thing discusses methods of obtaining accurate records during epidemics.

BIGELOW, G. H., and LOMBARD, H. L. Respiratory Tract Infections in Massachusetts in the Winter of 1928–29. New England J. Med., 201, 10: 474 (Sept. 5), 1929.

Cancer in Public Health—This discussion of the possibilities of official participation in cancer control recounts again the pioneering work of Massachusetts in this field.

EWING, J. Cancer as a Public Health Problem. Pub. Health Rep., 44, 35: 2093 (Aug. 30), 1929.

Nursing Economics—Although somewhat outside the strict limits of sanitation, this excellent resumé of the present status of nursing is well worth study by all sanitarians.

FOX, E. G. The Economics of Nursing. Am. J. Nurs., 39, 9: 1037 (Sept.), 1929.

Food Poisoning—An outbreak of food poisoning due to eating veal infected with *B. suipestifer* is unusual enough to warrant reporting. This one occurred in Great Britain.

GRIFFIN, A. J. B. An Outbreak of Food Poisoning Due to Salmonella Infection. Med. Off., 42, 11: 119 (Sept. 14), 1929.

Mental Hygiene—A symposium on Mental Hygiene from the point of view of the child and the adult, by a group of distinguished British physicians. The chairman raises this question in regard to the term "preventive medicine." Medicine implies healing; healing implies deviation from health. The object of preventive medicine is not to rectify deviations from health, but to prevent the necessity of "medicine."

HALL, A. J., *et al.* Mental Hygiene from the Point of View of the Child and the Adult. J. Roy. San. Inst., 50, 3: 133 (Sept.), 1929.

More Undulant Fever—Another paper covering the now familiar ground of etiology, epidemiology and laboratory diagnosis.

HARDY, A. V. Undulant Fever. J. A. M. A., 93, 12: 891 (Sept. 21), 1929.

Biology of Cancer—This paper appears to be an unprejudiced, inclusive, careful survey of the present status of our knowledge of cancer written by one who should know whereof he speaks. Beyond this the reviewer ventures no opinion.

JACKSON, H. Recent Advances in the Biology of Cancer. New England J. Med., 201, 7: 294 (Aug. 15), 1929.

Tobacco and the Heart—Out of North Carolina comes the statement that tobacco smoking has no permanent effect on blood pressure or weight. The effect of smoking is chiefly local, principally on the pharynx.

JOHNSON, W. M. Tobacco Smoking. J. A. M. A., 93, 9: 665 (Aug. 31), 1929.

Smallpox—What happens when a Massachusetts community evades the compulsory vaccination law. "Chickenpox" develops among adults. When the health authorities take a hand, they find 223 cases. Only 2 had been vaccinated and they more than 30 years before.

MACKNIGHT, R. P., and SCAMMAN, C. L. An Outbreak of Mild Smallpox in a Massachusetts Community. New England J. Med., 201, 8: 361 (Aug. 22), 1929.

Bacteria Associated with Dental Caries—Commendable restraint marks the conclusion of this report of bacteriological studies of carious mouths. Although no one has produced caries experimentally with the isolated aciduric organisms, there is yet no proof that they are not associated in some way with the disease.

MORISHITA, T. Studies on Dental Caries, with Special Reference to Aciduric Organisms Associated with this Process. J. Bact., 18, 3: 181 (Sept.), 1929.

Specificity of Scarlatinal Streptococci—From the other side of the world comes the report of the immunologic relationships between scarlatinal and other strains of hemolytic streptococci. Such widely separated studies are of value in confirming the growing knowledge of the etiology of scarlet fever.

MORIWAKI, G. The Specificity of Scarlatinal Hemolytic Streptococci. J. Bact., 18, 3: 139 (Sept.), 1929.

School Children's Eyes—Practical methods for eye examinations for young school children serve as an interesting basis for emphasizing the importance of adequate routine examinations.

RODIN, F. H. Eye Examination of School Children. J. A. M. A., 93, 12: 911 (Sept. 21), 1929.

Fertility and Economic Status—Believe it or not, poor women bear children for a longer period of years than do the richer. This is another finding from the Hagerstown Studies.

SYDENSTRICKER, E. Differential Fertility according to Economic Status. Pub. Health Rep., 44, 35: 2093 (Aug. 30), 1929.

Health Department Quarters—As a substitute for the usual corner in the cellar, adequate housing for municipal health departments is presented. Ground plans and descriptions of several plants are included.

TOBEY, J. A., and DRUMMEY, W. W. Adequate Health Department Quarters. Am. City, 41, 3: 143 (Sept.), 1929.

Urban Typhoid Fever Rates—Typhoid fever rates in the large cities have been reduced 90 per cent since 1910. Municipal sanitation and control of food supplies is largely responsible.

TOBEY, J. A. The Reduction of Urban Typhoid. Pub. Works, 60, 9 (Sept.), 1929.

Morbidity Registration Area—A tentative plan is proposed for the establishment of a National Morbidity Registration Area.

WILLIAMS, R. C. A Proposed Plan for the Establishment of a Morbidity Registration Area. Pub. Health Rep., 44, 37: 2201 (Sept. 13), 1929.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Rockefeller Foundation—During 1928 the Rockefeller Foundation, according to its annual report, in disbursing from income and capital $21,690,738: (1) contributed to the development of medical sciences through provision of funds for land, buildings, operation, or endowment for 18 medical schools in 14 countries; (2) provided for the support of the Peking Union Medical College; (3) made minor appropriations for improving premedical instruction in China and Siam, for operating expenses of 17 hospitals in China, and for laboratory supplies, equipment, and literature for European medical centers which are still feeling the after-effects of the War; (4) through small grants assisted certain departments of medical schools in France, Italy, and Ireland which offer exceptional facilities for graduate study; (5) continued to contribute towards the advancement of the biological sciences in institutions in 4 countries; (6) assisted the development of professional public health training in 8 schools and institutes in 7 countries and in 12 field training stations in the United States and abroad; (7) gave aid to 15 nurse-training schools in 10 countries; (8) helped Brazil to combat a new outbreak of yellow fever; (9) continued studies of that disease on the West Coast of Africa; (10) took part in malaria control demonstrations or surveys in 6 of the American states and in 18 foreign countries; (11) continued contributions toward the emergency budgets of 85 county health organizations in 7 states of the Mississippi flood area; (12) aided the governments of 21 countries in fighting hookworm disease; (13) gave funds to organized rural health services in 191 counties in the United States and toward state supervision of such services in 14 states in this country, and assisted in local health work in 23 foreign countries; (14) aided in the establishment or maintenance of certain essential divisions in the national health services of 23 foreign countries and in the state health departments of 19 American states; (15) provided, directly or indirectly, fellowships for 802 men and women from 46 different countries, paid the traveling expenses of 61 officials or professors making study visits in the United States or abroad and provided similar opportunities for 127 nurses and other public health workers; (16) contributed to the work of the Health Organization of the League of Nations through the support of international interchanges of public health personnel and the development of a world-wide service of epidemiological intelligence and public health statistics; (17) lent staff members as consultants to many foreign governments; (18) made surveys of health conditions or of medical or nursing education in 5 countries; (19) collaborated with the Rockefeller Institute for Medical Research in field studies of respiratory diseases and verruga peruana; (20) assisted in mental hygiene projects in the United States and Canada, in demonstrations in dispensary development, research, and teaching in hospitals and clinics in New York City, and in numerous other undertakings in public health, medical education, and allied fields.

Some of the things which have been done to combat disease during 16 years are as follows: Temporary antihookworm campaigns in southern United States have been broadened into permanent official rural health organizations, modest, but complete. Similar developments have been aided in many tropical and semitropical regions. Else-

where local health machinery has been created or reorganized with foundation help. Malaria has been studied more fully, and methods of control have been worked out at home and abroad. Yellow fever has been forced to retreat from Mexico and Central America and from Northern South America. It is now to be found only in Brazil and West Africa. A wartime antituberculosis organization built up with foundation aid in France has been wholly taken over by the French and is being incorporated into a general public health service.

Schools or institutes of public health have been created or extended with foundation funds at the Johns Hopkins and Harvard Universities in the United States, and in Toronto, London, Prague, Warsaw, Budapest, Belgrade, Zagreb, and Sao Paulo, Brazil. Pledges have been made toward similar institutions in Angora and Calcutta. Further aid has been given to the training of health officers through participation in the maintenance of field training stations, through support to the League of Nations' plan of international study tours by health officials, and through the granting of fellowships.

Brookline, Mass.—The Brookline Board of Health presents an account of its activities for the year ending December 31, 1928, in a 50-page report. It is a satisfaction to note from the table of expenditures that substantial amounts of money have been expended in 1928 and are recommended to continue preventive work in 1929. Among these activities are immunization against diphtheria, the vaccination clinic, the school of bodily mechanics, the dental clinic, medical inspection in the schools and especially the work of the health nurses, and the clinics at the health center.

The city reports a death rate (corrected for residence) of 11.55 per 1,000 population as compared with 11.06 in 1927. Diseases of the heart (128), cancer (81), and cerebral hemorrhage (60) are the leading causes of death; cancer showing a 30 per cent increase over the 1927 figure. The number of cases of diphtheria has decreased considerably since preventive work along this line was begun in 1923. During the 5 years previous to 1923 there were 248 cases with 11 deaths, as compared to 46 cases with no deaths in the 5 years subsequent to this date.

A table showing causes of absence of pupils from the public and parochial school, as ascertained by the nurses in 1928, indicates that "colds and coughs" with 314 cases, followed by "digestive disturbances" with 121 cases, lead the list. There were 749 absences caused by illness in contrast to 313 absences due to non-sickness.

Brookline is not without its health publicity. Its *Health Bulletin* is published quarterly and distributed to every house in the city by the Police Department. "We believe it is serving the purpose of promoting education in health matters, of informing residents of the quality of the milk sold by the various dealers and of giving publicity to the various activities of the department."

Milwaukee, Wis.—The section dealing with public health activities is one of 10 sections comprising the entire 1927 report of the Common Council of the city of Milwaukee. The report, printed on paper 8" × 10", is furnished with an excellent table of contents and each section is subdivided by the use of heavy type, headings and subheadings.

The general death rate of the city was 10.4 per 1,000 population in 1927, and it is stated that Milwaukee's average death rate for the last 5 years is not excelled by any other large city.

The infant mortality rate was the lowest ever experienced in the city, being 64 per 1,000 live births.

Attendance at the 18 child welfare clinics has continued to increase materially, being 25,679 in 1927 as compared to 10,588 in 1923. There has been an attendance of 3,109 preschool children at the clinics, while 12,835 children of preschool age were visited in their homes. Because of the increase of 4 part-time physicians, the number of pupils examined by each physician has been decreased from 4,431 in 1926 to 3,878 in 1927. Physical examinations of 67,673 school children were made by these school physicians and 58,569 defects with 23,769 corrections were recommended.

There has been marked improvement in the water supply during the year, due to 3 factors: (1) the sewage disposal plant, (2) improved methods of chlorination, and (3) development of better laboratory technic.

Many additional requirements have been imposed upon milk producers. All dairy firms are required to provide mechanical capping of bottles; orders were issued requiring the use of an approved closed-top pail for milking; all producers were required to cool properly their milk before shipping to stop the growth of bacteria; and a set of rules and regulations for the proper production and handling of milk and cream was prepared by a committee representing the producers, the dealers and the health department.

Syracuse, N. Y.—The *Story of the Year* gives Syracusans: (1) information on the work done and money spent by their city government, and (2) means of offering suggestions for improving the services of the city. An organization chart of the city on the inside cover is followed by a letter from the Mayor and a 3-page statement of accomplishments of 1928, and needs of the near future. The report is effectively illustrated with photographs, charts, and graphs, with a few brief summary tables.

From the health section it is learned that 2.1 per cent of city expenditures were for conservation of health, the total amount being $279,347. The first full-time health commissioner was appointed in 1928. From a total of 45 full-time and 33 part-time employees in 1923, the personnel of the department has been increased to 94 full-time and 37 part-time employees in 1928.

A bureau of health education has been established, the nursing service has been changed from the specialized to the generalized educational form, clinic sessions have increased, and new activities have been added, such as those for crippled children, dental hygiene, prenatal and preschool services. The per capita expenditure from city funds was $1.40 and from the Milbank funds, 27 cents. This does not include medical inspection in public schools, which is under the Board of Education, amounting to 38 cents per capita.

Ninety-six per cent of all births were cared for by physicians, 66 per cent occurring in hospitals. The infant mortality rate was 58.9 per 1,000 births, while the tuberculosis mortality rate was 61.2 per 100,000 population. The ratio of reported tuberculosis cases per annual deaths was 3.2 for the year. In 10 well baby clinics, 1,195 infants were registered as having made 6,004 visits, 32 field nurses gave generalized nursing service to all the bureaus needing it.

NEWS FROM THE FIELD

COFFEE, TEA AND TOBACCO USERS

FORTY-five per cent of the male members of the freshman class at the University of Illinois last year and 21 per cent of the female members denied the habitual use of coffee, tea and tobacco. Only 30 per cent of the male members of the class professed to be users of tobacco while 50 per cent drank coffee and 20 per cent tea.

FLOATING AND SEASIDE HOSPITALS

THE Floating Hospital and the Seaside Hospital, both activities of St. John's Guild, New York, N. Y., closed their season on September 7. The Floating Hospital made 53 trips and carried 44,838 children and their mothers. Seaside Hospital in its three months' season admitted and discharged 805 children, a total service of 15,556 hospital days. About forty tonsils operations a week were performed.

WHY WHOOPING COUGH IS PREVALENT

DR. John P. Koehler, commissioner of health of Milwaukee, Wis., ascribes the failure to control whooping cough largely to the practice of allowing well children to play with coughing children. Other causes, he says, are late diagnosis and late report to the health department by the physician, the ignorance of some parents who do not "believe in" contagion, objection to having homes placarded, failure to prosecute infractions of the law, and public indifference.

ELIMINATING DIPHTHERIA IN CHILDREN'S INSTITUTIONS

AT Mooseheart School, Mooseheart, Ill., there has been only one case of diphtheria since 1920, though the average number of children in the school during that time exceeded 1,000. The resident physician ascribes this record to the fact that every child entering the school since September, 1919, has been immunized with diphtheria toxin-antitoxin. The same practice is carried out at the Soldiers' Orphans' Home at Normal, Ill., which has an average of 700 children, and no case of the disease has developed in more than three years.

787 COUNTIES NOW "FREE" OF TB CATTLE

ON September 1 there were 787 counties, located in 33 states, which had been declared by the U. S. Department of Agriculture to be "modified tuberculosis-free accredited areas." In order to receive such designation a county must have had all of its herds of cattle tuberculin tested and the extent of tuberculosis among the cattle in the county must not exceed five-tenths of 1 per cent. In all cases the cattle which react to the tuberculin test are removed and condemned for slaughter. The total of 787 counties represents a gain of 219 counties in the last 12 months. In addition to the counties, 32 towns in Vermont were designated as modified accredited areas in the course of the year.

DR. PLATT GOES TO HONOLULU

PHILIP S. Platt, Ph.D., will sail from San Francisco, Calif., November 6 for Honolulu to accept the position of Director of the Palama Settlement. He has resigned as Executive Secretary of the Associated Out-Patient Clinics Committee and assistant director of the New York Tuberculosis and Health Association, New York, N. Y.

NEW ORLEANS HOSPITAL

COMPLETION of the Catherine Cordes Voss addition to the Miles amphitheatre of Charity Hospital here is announced by Dr. Arthur Vidrine, superintendent. Three new operating rooms, three new sterilizing rooms, and the renovation of older rooms and equipment in the building to which the addition has been made, were provided at a total cost of $62,500.

VACCINATION AGAINST TUBERCULOSIS IN FRANCE

IN a recent circular the Minister of Hygiene of France asks the prefects to take the necessary measures for increasing the use of the antituberculosis vaccine and quotes the favorable opinion on this subject expressed by members of the section on hygiene of the League of Nations and of the French Academy of Medicine.

The circular directs the prefects to ask the local branches of the National Association against Tuberculosis and the local public health authorities to organize a system of preventive vaccination against tuberculosis of newborn infants and older children. The vaccination, however, is to be optional; the decision in each case is to be made by the attending physician.

INTERNATIONAL

FIFTH International Congress of Physical Therapy, Liège, Belgium, will be held September 4–8, 1930.

The congress will consist of 5 sections: (1) Kinesitheraphy, including physical education; (2) radiology (roentgen therapy); (3) hydrology, climatology and thermotherapy; (4) electrology; (5) actinology.

Chairman of committee on organization is M. de Munter, professor à la Faculté de Médecine de l'Université de Liège, Liège, Belgium.

PERSONALS

R. K. GALLOWAY, M.D., director of the Carlisle County Health Unit, Bardwell, Ky., has been given a Fellowship from the International Health Board, and will use it to take a year's work at Harvard School of Public Health.

DR. FORREST J. PINKERTON, Honolulu, was made president and Dr. Archibald N. Sinclair, Honolulu, secretary, at the annual meeting of the Hawaii Territorial Medical Association, at Honolulu.

DR. JAMES H. FLYNN has been appointed health commissioner of Troy, N. Y., to succeed the late Dr. William J. Fleming.

DR. ESMOND R. LONG, professor of Pathology of the University of Chicago, has been appointed the new editor-in-chief of the *Journal of Outdoor Life*, the official publication of the National Tuberculosis Association.

DR. SAMUEL A. LEVINSON has been elected president of the Chicago Tuberculosis Association for 1929–1930.

DR. LEWIS WADE HEIZER, formerly of the Cincinnati, O., Health Department, is the new medical inspector of Watertown, N. Y.

CONFERENCES

Nov. 4–7, 8th Annual Meeting of the American College of Therapy, Chicago, Ill.

Nov. 11–13, National Society for the Prevention of Blindness, St. Louis, Mo.

Nov. 20–22, Southern Medical Association, Miami, Fla.

Dec. 3–5, 7th Texas Sanitary Short School, Edinburg, Tex.

Dec. 6–7, New Jersey Public Health and Sanitary Association, Asbury Park, N. J.

Dec. 25–Jan. 1, Society of American Bacteriologists, Ames, Ia.

Jan. 27–30, 12th Texas Water Works Short School, Abilene, Tex.

Malnutrition, Marasmus Infantile Atrophy Athrepsia

Maltose is the Most Satisfactory Carbohydrate to Increase Body Weight

Maltose is the Predominating Carbohydrate in Mellin's Food

To improve conditions that may be properly grouped under the above-mentioned terms, the first thought of the attending physician is an immediate gain in weight, and the second thought is to so arrange the diet that this initial gain will be sustained and progressive gain be established. Every few ounces gained means progress not only in the upward swing of the weight curve, but in digestive capacity in thus clearing the way for an increasing intake of food material.

As a starting point to carry out this entirely rational idea, the following formula is suggested:

Mellin's Food	**8 level tablespoonfuls**
Skimmed Milk	**9 fluidounces**
Water	**15 fluidounces**

This mixture furnishes 56.6 grams of carbohydrates in a form readily assimilated and thus quickly available for creating and sustaining heat and energy.

This mixture supplies 15.5 grams of proteins for depleted tissues and new growth, together with 4.3 grams of mineral salts which are necessary in all metabolic processes.

These food elements are to be increased in quantity and in amount of intake as rapidly as continued improvement is shown and ability to take additional nourishment is indicated.

A pamphlet devoted exclusively to this subject and a liberal supply of samples of Mellin's Food will be sent to physicians upon their request.

Mellin's Food Company, Boston, Mass.

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The Hemolytic Streptococci and Antistreptococcus Serum in Scarlet Fever*

AUGUSTUS B. WADSWORTH, M. D., FELLOW A. P. H. A.

Director, Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

THE relationship of the hemolytic streptococci to scarlet fever forms the basis upon which rests the serum therapy of the disease. Although the important work of Dochez and the Dicks started from the premise that a particular group of streptococci was the specific incitant of scarlet fever, previous experience with the identification of species in general and the streptococcus in particular, especially when based upon the variations in the agglutination reaction as it was in the beginning, suggested the possibility that the premise might be false, despite the fact that the results of their work had such unquestionable practical value in the treatment and prevention of the disease. The basis for the differentiation of a specific incitant of the disease seemed quite inadequate and untrustworthy. A thorough study was therefore made of the streptococci isolated from many different related and totally unrelated infectious processes. At the time this work was started the only method available for studying the toxin and antitoxin was the intracutaneous test on the human subject. This appeared to be an insurmountable obstacle to a very extended study until the goat was found to be a satisfactory substitute.

Since the reports published in 1926 on the study of the toxins of approximately 100 strains of streptococci from infections diagnosed as scarlet fever, and 100 strains from other infections, about 90 ad-

* Read before the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

ditional strains from each of these sources have been tested with very similar results. It has been found that over 85 per cent of approximately 200 strains of streptococci from cases of scarlet fever, and about 70 per cent of 200 strains of streptococci from other infections produced toxins which induced definite skin reactions in goats. Approximately 65 per cent of all these toxins, irrespective of whether the source of the strain was a scarlet or non-scarlet infection, were neutralized by a standard antitoxic goat serum produced against the Dochez N. Y. 5 strain, while 35 per cent were not.

It is evident that even if by any chance there is a particular streptococcus which is the specific incitant of scarlet fever it is impossible to differentiate it by any of the known tests.

In a paper presented before the New York Division of the Society of American Bacteriologists in November, 1925, which unfortunately was not published, I suggested that it might

> . . . perhaps border on the quixotic to question the necessity of differentiating a particular streptococcus as the incitant of scarlet fever in order to fulfil Koch's postulates. The attempts to distinguish the scarlet streptococci from other forms have led to important discoveries, but they are largely based upon the agglutination and the absorption-of-agglutinins tests which have not been found to be altogether reliable in the separation of the strains of bacterial species, less so possibly with the streptococci than with any other species . . . possibly the importance or necessity of differentiating the streptococcus into the scarlet and non-scarlet strains has been greatly overemphasized in some of the work. If the etiological relationship of the streptococcus can be said to be reasonably established—and it appears to be—is it necessary to differentiate a particular streptococcus as the incitant? Do we really know enough about toxin production in general among bacterial species, or the action of any of the bacterial toxins in the tissues, to reach a final conclusion? In my own experimental work there are a number of observations, some published, others awaiting further analysis, which differentiate the toxin production of the pneumococci and the streptococci from their parasitic adaptation in infection quite similarly if not quite so clearly as we now recognize it in scarlet fever. Moreover, observations are accumulating in my own experience to indicate that special conditions of tissue susceptibility underlie the manifestations of toxic action.
>
> Experiments on the experimental induction of pneumonia in the partially immunized rabbit early emphasized the importance of tissue susceptibility. The most striking illustration, however, was observed in some unpublished experimental work which for ten years or more has been awaiting further experimental analysis:
>
> Rabbits inoculated with the pneumococcus usually die promptly with a bacteremia without any macroscopic or microscopic change in the tissues and organs of the body beyond those of congestion. Occasionally there are signs of hemorrhagic extravasation, but this is rather exceptional. When the streptococcus possesses a sufficient degree of adaptation or virulence, the results are similar, but if the virulence is extremely exalted the occurrence of hemorrhagic reaction is per-

haps more common. Under certain conditions of susceptibility, at present possibly quite indeterminate, the reaction may be quite a different one. In rabbits inoculated intravenously with a culture of highly virulent pneumococci directly from the heart blood of a dead animal, and 2 to 4 hours later treated with antipneumococcus serum, the animals, with varying febrile reaction, which appear normal in their cages may suddenly, in a few seconds, die in typical anaphylactic shock. In one experiment with 4 such animals inoculated at 12 o'clock noon, all 4 died in this manner between 10 and 10:20 p.m. In a larger series, the animals died irregularly at different periods up to 30 or 36 hours. At autopsy the hemorrhagic condition was extreme in the various organs and tissues. The lymph nodes and the tracheal mucous membrane were almost black.

The development of endocarditis during immunization of horses for therapeutic serum affords striking evidence of the selective action of the toxin on the blood vessels, and possibly suggests a relation to some phase of the development of immunity.

I recall also a case in private practice of nephrolithiasis and purpura hemorrhagica associated with streptococcus infection. The patient was sent to me by a surgeon for diagnosis, having travelled for ten years to various health resorts abroad on account of her condition. The urine was heavily laden with pus, but there were no other symptoms, and no febrile reaction. A full description of this case appears in the *Journal of the American Medical Association,* 1918.[5] The purpura hemorrhagica in this case was one of the most marked examples I have seen—injury so slight as to be unnoted, giving rise to extensive purpura. Streptococci were isolated and demonstrated filling the pus cells. There was no cystitis, the focus being in the kidney, associated with a large calculus. Vaccines were prepared from the streptococcus culture in human blood broth by centrifugalization, filtration of the culture fluid, and suspension of the sediment heated to kill the cocci. The vaccine of killed cells when injected caused no unusual reaction. The culture filtrate, however, gave rise to extensive hemorrhagic reaction, resembling the purpura, which diminished steadily with each injection, and after complete immunization the patient has been free from the purpura.

This appears to me striking evidence of the selective action of the streptococcus toxin and suggests special conditions of susceptibility underlying the action of these toxins.

More recently this point of view has aroused considerable interest and stimulated experimental studies in this country and abroad; for example, those of Stevens with Dochez and others.[6-10] The studies of the action of toxin and its neutralization by antitoxins in different animals by Miss Kirkbride and Miss Wheeler have brought out many observations which are of practical significance in considering the development of scarlet fever, because they relate so definitely to the variation in the action of toxin according to the different phases of tissue susceptibility. In many respects the toxins of the streptococcus obtained from different sources proved similar when their toxicity was tested in different animals and when this toxic action was neutralized by a standard serum. The similarity was so general when a strain

with a broad antigenic value was used as to make it difficult or impossible to differentiate these streptococci from different sources into specific or special groups; yet with closer study some very marked differences were noted, even in the toxins which were apparently so similar. For example, toxins when tested in one individual apparently had a similar action varying only in degree, but when tested on another individual or on different animals, one was toxic and the other without action. In other words, there are phases of tissue susceptibility essential to the action of the toxin which may be present in one individual and not in another. This is an important fact when one considers the development of scarlet fever, and presents also certain difficulties in testing tissue susceptibility by the intracutaneous test with one toxin, and stresses the importance of selecting a standard toxin of sufficiently broad action to give results of practical value. Moreover, the toxins are apparently complex; one may be completely neutralized by an antitoxin whereas another may be only partially neutralized by this antitoxin, and it appears that these differences in reaction are due to different activities of the toxin, because the activity which is not neutralized by one antitoxin is neutralized by another produced by a different strain or possibly in a different animal. Toxins which are apparently similar when neutralized by one antitoxin are thus shown to be quite dissimilar when tested with another produced by different strains of the streptococcus or by the same strain in a different animal, and also when tested in different animals or in different persons. The results of this work thus have a very important bearing on the specific etiology of scarlet fever and suggest the conditions underlying the development of the disease—possibly explain the reason why scarlet fever often fails to develop after exposure when expected, or appears when least expected.

The preparation of different antitoxins afforded an excellent opportunity for the comparison of the different strains as antigens. The valency of the antitoxins prepared with some strains was much more limited than that of antitoxins prepared from other strains. Moreover, the potency varied. The selection of a standard strain for the purpose of comparison or for the preparation of therapeutic serums, therefore, is extremely important. The Dochez N. Y. 5 strain has proved without exception the most satisfactory strain from the standpoint of polyvalency and antigenic potency. Strains were found which produced a stronger toxin but these failed to produce serum of higher potency or as great polyvalency. The Dick strains I and II were not satisfactory. In no horses we have tested has it been possible to obtain a serum of sufficient potency for distribution. The

high potency and broad polyvalency of the serums produced by immunization of horses with the Dochez N. Y. 5 strain proved so much greater than that of any other serum that in the preparation of the therapeutic serum there appeared to be no necessity for the addition of other strains—rather the contrary.

Methods of immunization differ in that the Dicks have recommended immunization with the toxin, whereas Dochez has emphasized the importance of injecting subcutaneously living virulent cultures into a mass of agar. Immunization with the toxin alone has not in our experience produced a serum of sufficient potency for the treatment of the disease. It is necessary to inject living cultures to obtain the most potent serums.

Production of serums of the highest potency and polyvalency has been greatly handicapped by the difficulties of standardization, and also greatly complicated by the selection of different strains for immunization of the horses. With many of these strains standardization has only been practicable on human subjects. The serums for distribution have in a great majority of the instances been concentrated. Standardization is much more difficult when it has been concentrated. We have been particularly fortunate in having selected a single strain which has not only lent itself most satisfactorily to the immunization of horses but can be standardized on the goat as well as the human subject; hence it has been possible to follow the progress of the immunization of the horses closely, and bleed at opportune periods of immunization. Finally, the potency and polyvalency attained in this monovalent serum have been such as to render concentration quite unnecessary, and in fact a questionable procedure. Serums of the highest potency have scarcely been bettered by concentration.

The results of comparative tests which appeared in a recent publication of the *Journal of Hygiene*[11] very strikingly illustrate the points which I have brought out. In these tests the therapeutic serums from a number of laboratories were obtained and tested. With one exception these were all concentrated, and nearly all of them had a potency less than half that of our standard control serum. The standards for serums available for treatment have been advanced within the last two years, as a result of the distribution of a standard or control serum for purposes of comparison to the different producing laboratories, but the minimum federal standard of 200 units seems totally inadequate, and for some time it has been our practice to distribute no serums of less than 600 units, 30,000 skin-test doses, and the majority have approximated 800 units per c.c. The commercial

and other serums which are distributed under federal license are labeled as to potency, and the clinician can very readily estimate the potency of any serum by dividing the total units or skin-test doses by the number of cubic centimeters in the dose. In the literature the comparison of the dosage, when reported, in skin-test doses and also in cubic centimeters, indicates a rather low potency approximating the minimum federal standards.

The action of the serum in the treatment of the disease has been most carefully determined by Blake in his early work.[12-14] These studies point out very clearly the limitations in treatment. He was able to demonstrate the presence of toxin in the blood during the earliest stage of the disease and also the neutralization of that toxin by the administration of serum in the uncomplicated case. In the later stages of the disease and in cases complicated by extension of the infectious process the toxin was not so completely neutralized by the serum and the treatment was not so effective.

Reports on the clinical treatment of scarlet fever have now accumulated so there are large series of cases in the literature. The potency of the serums which were used is not clearly stated in many articles. One can only infer from the dosage when recorded, or from experience in testing representative samples of these serums, that the potency was very low or might even have been entirely lacking. We have found serum in which we could not detect any antitoxic activity although it was labeled to neutralize 30,000 skin-test doses per c.c.

There are different points of view regarding the practical value of serum therapy in scarlet fever. The disease is so much milder than formerly; there are so many cases which recover quickly and spontaneously without complications; and so many others of a serious character with complications which do not respond definitely to the serum treatment, that some clinicians question its practical value. The results, however, are so striking when cases are treated early that the great majority of clinicians strongly advocate its use.

Apparently many treat only the selected cases of more serious types. The seemingly mild onset in a few of the complicated and serious infections constitutes a real difficulty because it is impossible to determine this fact at the time that treatment should be given. If such favorable results were obtained with the early serums one would naturally expect the more potent serums to be even more efficacious. Certainly it is inconceivable that the early administration of serums of the highest potency should not be a very important factor in the prevention of the unforeseen development of complications, which is really the crux of the problem. Thus it is obviously

owing to the fact that the disease has become, in such a vast majority of cases, of a mild type, that the value of serum therapy is not brought out by comparative statistics. Delayed diagnosis and treatment also tend to make the conclusions from these statistics untrustworthy. One is forced to rely upon the study of the effect of serum in individual cases, particularly the complicated and fatal cases.

Reports have been received on the treatment of 587 cases of scarlet fever with our monovalent antistreptococcus serum, unconcentrated, which titers from 600 to 800 units per c.c., or 30,000 to 40,000 skin-test doses. The individual dose approximated 10 c.c. or 6,000 to 8,000 units. These cases have been treated under various conditions, and on account of incomplete data it is impossible to classify them into groups which could be considered as having received satisfactory treatment as contrasted with those which received unsatisfactory treatment. The cases have been grouped according to the type of the disease in Table I.

TABLE I

CLASSIFICATION OF CASES OF SCARLET FEVER TREATED WITH NEW YORK STATE UNCONCENTRATED ANTISTREPTOCOCCUS SERUM

	Total		Mild		Moderate		Severe	
	No.	%	No.	%	No.	%	No.	%
Cases treated	587		103	18	282	48	202	34
Fatal cases *	27	5	0	0	3	11	24	89
Recovered cases	560	95	103	18	279	50	178	32
Recovered cases in which complications were present	149	25	15	10	55	37	79	53
a. serum had definitely favorable action	92	62	10	11	34	37	48	52
b. apparently improved by serum but no change noted in complications	25	17	3	12	9	36	13	52
c. serum had no apparent effect	13	9	0	0	6	46	7	54
d. results of serum treatment inconclusive	19	13	2	10	6	31	11	58

* 18 cases with complications
9 cases without complications
1 very severely toxic
2 fulminating
6 serum administered within 24 hours antemortem (2 anaphylactic shock)

In practically all of the cases which recovered the effect of treatment is such as has been very generally described, fading of rash, fall in temperature and pulse rate, relief of symptoms due to toxic condition, and marked subjective signs, 12 to 48 hours after administration of serum. The proportion of complicated cases which recovered —149 of the total 587 cases—suggests that physicians had selected the severe type of case for serum treatment. Practically all of the

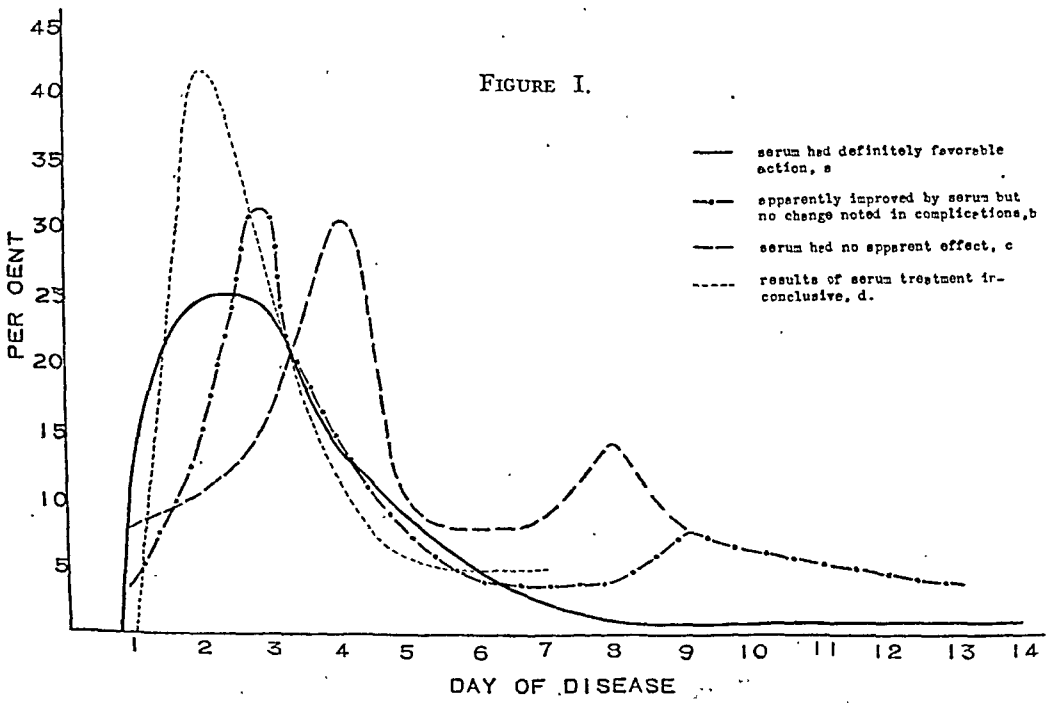
27 fatal cases were infections with complications, or were of the fulminating or malignant type, or were treated late in the disease, in some instances shortly before death. The fact that there were 176 complicated or fulminating cases out of 587, and the rather high mortality of 4.59 per cent are further indications of the severe type selected for treatment. However, that there were 149 cases with complications which recovered is of interest, especially as some of these cases were severe types and evidently had an extension of the infectious process so that they were not simple toxemias.

Of the 149 cases which had complications and recovered, 136 improved under serum treatment. There were no definite signs of improvement in the remaining 13. Of the 149 recoveries with complications, 34 had otitis media, 5 mastoiditis, 19 cervical adenitis, and 9 some gland involvement, 2 involvement of the salivary glands, 2 endocarditis, 4 arthritis, 6 rheumatic affection of the joints, 14 varying degrees of nephritis, 7 abscesses (neck, tonsils, submaxillary glands, etc.), 1 axillary cellulitis, and the remaining had minor extensions of the process.

There were 13 cases in which the serum had no apparent effect on the course of the disease. The character of the complications, the late stage at which treatment was started, or the inadequate dosage,

DAY OF DISEASE ON WHICH SERUM TREATMENT FIRST ADMINISTERED IN RECOVERED CASES WITH COMPLICATIONS

FIGURE I.



accounts for many but not all of these. There is always a varying but definite number of cases of all infectious disease which do not respond to serum treatment. The cases which did not respond to treatment, whether they recovered or died, are of such interest that their histories have been summarized.

SUMMARY OF THE RECOVERIES THAT APPARENTLY DID NOT RESPOND TO TREATMENT (13)

1. F., age 5. Onset, 2/20; rash, 2/23. Symptoms severe: acute conjunctivitis, nephritis, otitis media; measles. 2/28, 7,200 to 8,000 units serum intramuscularly; infection of eye 6 days after onset. No apparent results from serum.
2. F., age 43. Onset, 3/28; rash, 3/31. Symptoms moderate: discharging ears, cervical glands tender and swollen. 3/31, 24,000 units serum intravenously; 3,000 units diphtheria antitoxin on admission. Results of serum "none."
3. M., age 8. Onset, 12/24; rash, 12/25. Symptoms moderate: adenitis, arthritis, endocarditis. 12/30, 6,000 units serum intravenously. Patient recovered fully; had typical desquamation. Complications developed several days after administration. Serum had apparently no effect on general symptoms.
4. F., age 5. Onset, 4/2; rash, 4/3. Symptoms moderate: cervical adenitis. 4/5, T. 101°, 6,000 units serum. 4/6, T. 103°; 4/8 to 4/11, 102°; 4/12, 103° (earache). 4/14, T. normal.
5. F., age 7. Admitted to hospital, 4/26. Symptoms severe: bilateral mastoid (operated), double otitis media, arthritis, glands, infected finger. 4/26, T. 105°, 12,000 units serum intramuscularly. 4/27, T. 102° rising to 105° in p.m.; profuse nasal discharge; 12,000 units serum intravenously and 12,000 units diphtheria antitoxin. 4/28, T. 101°, 18,000 units serum intravenously. "No apparent effect from serum."
6. M., age 6. Onset, 7/19; rash, 7/20. Symptoms severe: swollen glands, abscess on neck and right forearm; patient cyanosed on admission; pulse imperceptible. 7/21, T. 105°, 6,000 units serum intramuscularly. 7/22, T. 101°. 7/23, T. 104°, 6,000 units serum intramuscularly. Results of serum, "none."
7. F., age 33. Onset, 12/13; rash, 12/15; hemolytic streptococci isolated. Symptoms moderate: sinusitis. 12/15, 12,000 units serum; 12/16, no improvement; 12/17, T. normal, rash fading; 12/19 to 12/26, persistent temperature.
8. F., age 2½. Onset, 2/9; rash, 2/10. Symptoms severe: otitis, glands. 2/16, 2/17, 2/18, 6,000 units serum each day. T. 102° to 104° during serum treatment. Results, "none."
9. F., age 8. Onset, 4/29; rash, 5/1. Symptoms severe: lobar pneumonia, double otitis media. 5/2, 6,000 units serum intramuscularly. "No apparent effect."
10. F., age 8. Onset, 4/16; rash, slight 4/17 and 4/18, definite 4/19. Symptoms moderate: lymphadenitis both sides neck. 4/19, 7,200 units serum. T. returned to normal on 6th day after administration of serum.
11. M., age 3. Onset, 2/21; rash, 2/26, lasting 6½ days. Symptoms moderate: otitis on 6th day. T. advanced from 101° to 104°. 2/28, 3,200 units serum.

3/1, 1,600 units serum intramuscularly. Discharge from ears for 1½ months.

12. F., age 6. Onset, 1/8; rash, 1/9; streptococci isolated from throat culture. Symptoms severe: nephritis, otitis media, mastoiditis, rheumatic syndrome, urticaria. 1/11, 6,000 units and 1/12, 600 units serum intramuscularly. Serum had apparently no effect.
13. F. Onset, 3/28 (operated for empyema on 3/28); rash, 3/30. Symptoms severe: empyema. 4/2, 6,000 units serum; serum rash, considerable pains; very toxic. Serum apparently had no effect.

SUMMARY OF THE FATAL CASES (27)

1. M., age 3. Onset, 2/5, " with sore throat and convulsions; T. 105.6° (rectal); angina marked on 3d day; comatose throughout illness; systolic murmur at apex of heart began 2/10, also middle ear at same time." 2/11, 5 p.m., 800 to 1,200 units serum subcutaneously; dose repeated at 11 p.m. with " no visible change." Death, 2/13.
2. M., age 25. Clinical diagnosis: scarlet fever or erysipelas. Previous history: patient admitted to hospital 10/4/24 with gun-shot wound; tetanus antitoxin (1,500 units) given at this time. 6/10/25, while wound was still discharging, left hospital to visit his children at orphanage; scarlet-like rash appeared; T. 104°; 0.2 c.c. antistreptococcus serum intracutaneously in each of 2 areas produced local blanching in 5 hours; 1,600 units then given intravenously and 3,200 intramuscularly—marked toxemia; condition not favorable. Following morning rash entirely disappeared, T. 100°; patient comfortable and improvement striking. Death several weeks later from septicemia.
3. F., age 42. Had nursed daughter who had developed scarlatinal rash and otitis media following tonsillectomy. Daughter's rash disappeared 24 hours after administration of 7,200 to 8,000 units of serum; other symptoms persisted but she finally recovered. Mother developed rash day or two after daughter, with marked angina of throat, also subacute arthritis becoming more acute. Serum produced local blanching of rash; 7,200 to 8,000 units given intramuscularly; rash disappeared in 24 hours, otherwise no change; 2 days later a subacute erysipelas became rapidly acute and fatal in about 48 hours.
4. M., age 19. Onset, 1/27; rash, 1/29. Symptoms severe: angina and marked toxemia. 1/31, 12,000 units serum intravenously, 6,000 intramuscularly; later that evening 18,000 units intravenously. T. dropped; patient seemed less delirious, but died 2/1.
5. M., age 2. Onset, 11/5; rash, 11/6. Symptoms severe. 11/10, less than 4,000 units serum. Death, 11/11.
6. F., age 23. Onset, 1/28; rash, 1/29. Symptoms severe. 2/2, 4,000 to 8,000 units serum intramuscularly. Death, 2/3.
7. M., age 2. Onset, 2/17; rash, 2/18. Symptoms severe: profuse nasal discharge. 2/22, 12,000 units diphtheria antitoxin and from 4,000 to 8,000 units antistreptococcus serum intramuscularly. Death, 2/26.
8. M., age 54. Onset, 1/8. Symptoms severe: oedema of larynx. 1/12, 6,000 units serum. Died following day.
9. F., age 4. Onset, 2/9; rash, 2/10. Symptoms moderate. T. 102°. 2/11, 6,000 units serum intramuscularly; patient much improved: T. normal, P. 96. 2/16, T. 103°, acute serum rash; cervical glands enlarged and tender; T. rose

to 104°—patient seemed very sick, serum rash increased. 2/20, patient more toxic, nauseated and vomited; considerable mucopurulent discharge in throat. Death, 2/23, probably from laryngeal edema.

10. M., age 3. Onset, 12/24; rash, 12/27. Symptoms severe: malignant type. 12/28, 4,000 to 8,000 units serum intramuscularly. Death, 12/30.
11. M., age 7. Onset, 7/1; rash, same day. Symptoms moderate. Approximately 6,000 units serum intramuscularly; child apprenhensive, struggled. Two minutes after administration of serum, child had convulsion; respiration ceased; death attributed to status lymphaticus.
12. M., age 7. Onset, 7/1; rash, 7/2. Symptoms severe: double otitis media and cervical adenitis. Became very toxic on 3d day. Serum (dosage not stated) given on 4th, 5th and 6th days. Condition greatly improved for about 1 week, when severe infection of cervical glands developed with erosion of jugular vein and large artery. Death on 21st day of disease from hemorrhage and sepsis.
13. M., age 7. Onset, 7/1 with profuse rash. Symptoms severe: cervical adenitis, fatal erosion of external jugular vein and lingual artery. Patient received 12,000 to 16,000 units of serum daily for 6 days beginning 3d day; general symptoms improved. Death, 2 weeks after onset.
14. F., age 39. Onset, 2/4 with rash. Symptoms moderately severe but with uncontrollable nausea and vomiting; complete suppression of urine for 36 hours. 2/6, T. 106°, 6,000 units serum; patient improved; rash faded. Death, 14th day of disease.
15. M., age 7. Onset, 2/9; rash, 2/10. Symptoms septic: marked throat conditions; first 2 days patient did not promise to be severe case but became more septic. 2/13, T. 103°, 6,000 units serum; 2/14, dose repeated; little or no improvement. Death, 2/15.
16. M., age 24. Onset, 3/7 with rash, T. 104°. Symptoms severe. (2/24, patient had operation for ruptured gangrenous appendix.) 3/8, T. 102°–103°. 3/9, 6,000 units serum intramuscularly; T. then 104°–105° and remained high; patient became delirious and died, 2/10.
17. M., age 5. Onset, 3/30 with rash. Symptoms moderate until 4/10 when they became severe: double otitis media, double mastoiditis, broncho-pneumonia, and acute nephritis. 4/11, 13th day of disease, 6,000 units serum subcutaneously; T. remained high; no improvement. Mastoid operation, 4/13. Death, 4/16.
18. M., age 26.. Onset, 1/27; rash, 1/28. Symptoms severe. History of epilepsy. 1/20, 12,000 units serum intramuscularly; dose repeated in evening. T. dropped but patient was very toxic and comatose. 2/4, pneumonia of left lower lobe developed. Death, 2/6. Autopsy: broncho-pneumonia.
19. M., age 38. Onset, 6/6; rash, 6/7. Symptoms severe: T. 104°, hemorrhagic nephritis, uremia and septicemia. 6/10, 18,000 units antistreptococcus serum and 12,000 units diphtheria antitoxin; T. fall only temporary; uremic poisoning. Death, 6/17.
20. F., age 28. Onset, 5/6; admitted to hospital, 5/10. Symptoms moderate: T. 104°; 6,000 units serum subcutaneously. 5/11–13, T. 99°–101°; 6,000 units serum intramuscularly. 5/19, type III pneumonia developed; fatal 5/28.
21. M., age 3½. Onset, 8/7; rash, 8/9. 8/12, T. 103.6°; patient unconscious; rash all over the body; 6,000 units serum intramuscularly. Death same day.

22. F., age 6. Onset, 1/8; rash, 1/9. Symptoms severely toxic: T. 105°–106°. 1/10, 6,000 units serum intramuscularly; T. dropped temporarily. Following day streptococcus pneumonia developed, T. 104°, 6,000 units serum intramuscularly, T. dropped to 102° but rose again quickly. Death, 1/16.
23. M., age 8. Onset, 4/1; rash, 4/2. Symptoms severe. 4/3, 3,000 units serum. In 10 minutes patient irrational, cyanosed, and pulseless; adrenalin had no effect. Death 15 minutes after serum injection.
24. F., age 26. Onset, 3/9; rash, 3/10. Symptoms severe: patient toxic and delirious. 3/12, 12,000 units, 3/13, 12,000 units serum intramuscularly. T. dropped from 103° to 100° following day—patient brighter and mentally clear, pulse improved. 3/15, again toxic, stuporous. 3/16, T. 105°; 12,000 units serum intravenously. 3/17, T. 106°; 18,000 units serum intravenously; T. dropped to 101°, returned to 106° within next 4 days. Death, 3/21.
25. M., age 7. Onset, 2/8; rash, 2/10. Symptoms severe: vomiting and delirium, discharge of right ear. 2/13, 6,000 units antistreptococcus serum intramuscularly; dose repeated in the evening together with 18,000 units diphtheria antitoxin intravenously. 2/14, T. dropped from 105° to 101° but returned to 103°; 6,000 units serum and 12,000 units antitoxin intravenously. 2/19, serum rash. Death, 2/22.
26. F., age 12. Onset, 5/3; rash, 5/5. Diagnosis: scarlet fever and nasal diphtheria. Symptoms severe: vomiting; admitted to hospital in very serious condition, toxic and cyanotic. 5/8, 6,000 units antistreptococcus and 6,000 units diphtheria antitoxin intramuscularly; in the evening 12,000 units serum and 12,000 units antitoxin intravenously; half an hour later 18,000 units serum and 12,000 units antitoxin intraperitoneally. 5/9, 12,000 units serum and 12,000 units antitoxin intravenously; in the evening 6,000 units serum and 12,000 units antitoxin; pulse improved but temporarily. Death, 5/10.
27. M., age 32. Onset, 5/6; rash, 5/7. Symptoms severe: nephritis and cardiac condition. 3,000 units antistreptococcus serum; also diphtheria antitoxin. Died in 4 days.

These fatal cases were evidently severe infections with two exceptions, 15 and 17, which had a mild onset and became complicated—very striking illustrations of the impracticability of distinguishing early in the disease a mild form of scarlet fever that does not require serum treatment. Nine of these 27 cases can scarcely be said to have had sufficient serum. Three of these, 5, 6, and 8, not only received insufficient serum but received it late, less than 24 hours before death; and another, 10, 48 hours before death. Beside these, 3 cases (1, 15, and 17) were treated late. Three (2, 12, and 13) improved under serum treatment but died later. Four (7, 19, 25, and 26) apparently had diphtheria and 3 (18, 20 and 22) pneumonia. Two cases (11 and 23) died of anaphylactic shock, in one instance attributed to status lymphaticus.

Case 3 is interesting because both mother and daughter developed the disease and were treated with serum. The daughter recovered promptly; the mother died with acute erysipelas. The serum was evi-

dently effective in one instance and not in the other. Case 9 is especially interesting because it suggests the possibility of serum sickness acting as a predisposing condition, favoring the development or extension of complicating processes.

The results of serum therapy in our experience, as recorded in the tables, correspond in general with those published by other observers. The mortality or the recovery in complicated cases depends largely upon the severity of the disease in the cases which have been selected for treatment. The small proportion of mild cases is obviously an indication that the cases treated were severe infections. A considerable number, at least 3, of the fatal cases should be eliminated on account of the fact that the quantity of serum was inadequate and was given late in the disease, 24 hours or less before death. It has not been practicable to eliminate those in which the physician delayed treatment until the prognosis had become serious or definitely unfavorable, but there is a considerable number of such cases.

One of the objections to the serum treatment of all cases of scarlet fever is the occurrence of serum sickness. The quantities of serum are such as to give rise to well marked reactions a week or 10 days after treatment. In the series there are 3 cases of anaphylaxis; 2 of them are listed in the series of fatal cases (11 and 23), 1 was diagnosed as status lymphaticus, and the other did not respond to adrenalin and died within 10 minutes after serum treatment. The third case of anaphylaxis responded to adrenalin and recovered. No history of previous sensitization was obtained. The percentages of serum sickness reported in the literature vary greatly; 30 and even 40 per cent are recorded. Whether or not this is directly proportional to the quantity of protein injected is difficult to determine. The percentages of serum sickness were high in some instances where large quantities of serum were given, but the data are inadequate to indicate the relationship between the occurrence of serum sickness and the potency of the serum used. The concentrated product does not appear to lessen the number of reactions materially, for the concentrated serums have not been of sufficiently high potency so that the dosage, and therefore the quantity of protein, could not be reduced materially. In our experience, approximately 28 per cent developed serum sickness.

Statistics indicate quite definitely some protection as a result of vaccination or active immunization with the streptococcus toxin, but this has not been altogether reliable. As a result of experience, the dosage and the number of inoculations have been increased in the hope of securing more effective protection, all of which raises a ques-

tion as to its practical value as contrasted with close observation and prompt treatment of cases as soon as they develop. Although active immunization when adequate and applicable is effective, passive immunization with serum has not received much general support—rather the contrary. Our policy has been a conservative one. We have not recommended protective treatment, save in special instances, and have questioned the practical value of its general application.

The practical results of serum therapy in scarlet fever with antistreptococcus serum produced by a streptococcus isolated from a case of scarlet fever might lend support to the view that a particular streptococcus is the specific incitant of the disease were it not for the fact that this serum is also effective in other streptococcus infections. Erysipelas was also attributed to a specific organism, but subsequent work has shown that it is impossible to differentiate the streptococcus of erysipelas. Recently special antistreptococcus serums have been produced for the treatment of erysipelas. These serums were tested in comparison with a serum produced for the treatment of scarlet fever against toxins produced by strains isolated from cases of erysipelas. Our results indicate that the antistreptococcus serum produced by the Dochez N. Y. 5 strain has an equal or even greater potency and polyvalency, and the serum used in scarlet fever has also been used in cases of erysipelas as effectively as the special antistreptococcus serum for this disease.

CONCLUSIONS

There is no definite evidence that a particular group of streptococci are the specific incitants of scarlet fever—rather the contrary. Analysis of the morphological, biological, serological and immunological characters of approximately 400 strains of streptococci from different sources fails to distinguish any distinct groups of streptococci associated with the different infectious processes incited by these organisms. The toxic action of 85 per cent of 200 strains of streptococci from scarlet fever and 70 per cent of 200 strains from other sources was quite similar when tested in goats. Approximately 65 per cent of all these toxins, irrespective of whether the source of the strains was a scarlet or non-scarlet infection, were neutralized by control antitoxic serum produced by a single strain.

A study of the action of streptococcus toxin in different individuals and in different animals, and of its neutralization by different antitoxins, demonstrates that certain phases of tissue susceptibility are essential to the action of that toxin. Since tissue susceptibility is such an important factor, and since it is practically impossible to demonstrate a specific incitant of scarlet fever or other infectious processes attributed to the streptococcus, the necessity for assuming a specific incitant of the disease may be reasonably questioned.

Since the different streptococci vary greatly in their toxic and antigenic action, it is essential to select the most representative strain or strains for the immunization of horses, in order to obtain serums of the highest potency and broadest poly-

valency. The Dick strains I and II which have been used so generally have not proved satisfactory. Of all the strains tested to the present time the Dochez N. Y. 5 is the most representative and effective in the immunization of horses.

The method of immunizing horses either with toxin alone or with culture alone injected subcutaneously into agar has, in our experience, proved to be inadequate. The standards of potency and polyvalency of therapeutic serums for treatment should be advanced. (According to our experience a minimum standard of 400 to 500 units would be a practical one.) It has not been difficult to obtain a potency of 800 units per c.c. The practical value of concentrating serum has not been demonstrated.

Effective agents for the prevention and cure of scarlet fever are now available and their practical value is clearly defined as a result of recent experience. Vaccination by repeated doses of toxin is an effective measure, but the increasing number of injections and dosage required as a result of experience takes time, which is a practical difficulty. The duration of immunity has not yet been established. The prophylactic injection of serum has not received general support—rather the contrary—and as a practical measure has little, if any, advantage over the immediate treatment of cases as they develop, providing the persons exposed are kept under observation, which is an essential procedure in outbreaks, irrespective of preventive inoculation. Preventive measures in scarlet fever thus have an application practically limited to special outbreaks.

The therapeutic action of the serum in the cure of the disease is prompt and effective. The necessity of using it in mild cases has been questioned. In the very toxic, fulminating cases, and late in the disease after serious complications have developed, the action of the serum is not always apparent, or is evanescent, but it does no harm. Evidence is accumulating that some of the cases with complications respond to treatment and that the administration of the serum prevents the development of these complications. Thus it is of the utmost importance that serums of the highest potency and polyvalency be used in the treatment of this disease if definite information is to be gained from statistics.

The disease has become so mild or modified in type in recent years, and varies so greatly in different groups of cases; the mortality is so low and spontaneous recovery so prompt and frequent; the potency of the serums used in the treatment of cases so seldom recorded, and the types of cases selected for treatment are so variable; that it is impossible to compare statistical reports or to draw definite conclusions. There is no question, however, that prompt treatment with an adequate dosage of potent serum is not only effective in curing or shortening the course of the uncomplicated disease, but that it also prevents the development of complications in many cases treated.

This series of cases cannot be considered to have been treated under the most favorable conditions. It includes cases in all districts of the state, urban and rural, and is not limited to those treated in the best hospitals.

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NOTE: The work here described has been done very largely by Misses Kirkbride, Wheeler and Hendry. Much of it has already been published, particularly the studies of the streptococcus and the standardization of the serum.[1-4]

Imagination and That "Cooked" Taste in Milk

WHILE in Olean several weeks ago in connection with a "Milk Week" program, a member of the department staff was taken to visit the plant of a young milk dealer. According to the dealer's own statement, at one time he had been an active opponent of pasteurization but early in the course of the serious typhoid fever epidemic which had visited the city he went out on his route one day and discovered that a number of his patrons had gone over to dealers in pasteurized milk. Within twenty-four hours he had decided to take up pasteurization, had ordered equipment and had never had any occasion to regret the change. For a period of about two weeks after he started pasteurizing he was unable to get new bottle caps and continued to deliver his milk with a "raw" milk cap. The day that his milk arrived for the first time bearing a "pasteurized" label he began to get protests from his patrons, who said: "We can't use pasteurized milk; we don't like the taste of it," etc. When he called their attention to the fact that they had been using pasteurized milk for two weeks without knowing it, most of them were converted.

This recalls another episode supporting the statement so frequently made that if milk is properly pasteurized even an expert cannot distinguish it from raw milk by the taste. About two years ago the annual meeting of the Pennsylvania Association of Dairy and Milk Inspectors was held at Harrisburg and at an evening banquet milk was served and each one of the approximately 100 "experts" was asked to drink some of the milk with the understanding that the reason for the request would be explained later. Subsequently ballots were distributed and each one was asked to express an opinion as to whether the milk was raw or pasteurized. After the vote had produced an approximately even division of opinion, it was announced that the milk had been pasteurized at 145 degrees.—*Health News*, N. Y. State Health Dept., Oct. 7, 1929.

Relationship of the Streptococci Causing Erysipelas*

ANNA W. WILLIAMS, M. D., FELLOW A. P. H. A.

Bureau of Laboratories, Health Department, New York, N. Y.

IT is interesting to recall that the first specifically named streptococcus was designated *Streptococcus erysipelatos* (Fehleisen in 1882). Later (1889), Widal and many others following him claimed that this streptococcus was identical with the *Streptococcus pyogenes* described and named by Rosenbach in 1884 for a chain coccus isolated from pyogenic lesion.

This idea of the unity of these strains prevailed until comparatively recent times and even yet, though the more minute serologic tests have added to our knowledge of the diversity and relationships of streptococci, the relationships of the streptococci isolated from erysipelatous lesions are far from being clearly demonstrated.

The chief tests that have been claimed as significant in differentiating these streptococci from other streptococci of the beta type are the absorption of agglutinins, the effect on so-called endotoxins of their antibacterial serums and the neutralization of exotoxins with their antitoxins. All of these tests require highly trained technical workers. Perhaps this is the reason why comparatively little minute and comprehensive work has been done with them and why such varied reports regarding them have been published.

The first work published on agglutinin absorption with an appreciable number of strains from erysipelas was by Birkhaug[1] in 1925. He claimed that out of 34 strains 91 per cent were agglutinated (and absorbed (?)) by "seven immune erysipelas serums" and that "of 45 strains of hemolytic streptococci from sources other than erysipelas, 9, or 20 per cent, were agglutinated by several immune erysipelas serums."

At that time we had begun to gather strains of hemolytic streptococci from erysipelas in connection with our work on scarlet fever, and on our request Birkhaug kindly sent us 11 of his strains. We isolated 19 strains from typical erysipelas cases at Bellevue Hospital,

* Read before the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting in Minneapolis, Minn., October 1, 1929.

1 from a case following scarlet fever at Willard Parker Hospital, and 1 from a laboratory infection with a strain isolated from a scarlet fever throat.

When Birkhaug sent his strains he said they all belonged to one serologic group by absorption of agglutinins. When we found on testing these strains with carbohydrates immediately after receiving them that they fell into two groups—one of 8 strains into the pyogenes group (Holman's classification), and the other of 3 strains into Holman's subacidus group—we injected two lots of rabbits, each with a strain from one of these groups, in order to obtain an agglutinating serum, choosing C 3 from the pyogenes group and B 3 from the subacidus group. After obtaining a satisfactory serum we found that all but 1 of the pyogenes group from Birkhaug fell into the same agglutination group, and all 3 of the subacidus fell into another agglutination group. We called the first group E Type I and the second group E Type II. Of 21 strains of our own, 7 fell into the E Type I group, 1 into the E Type II group, and 13 into neither. Later we found that 3 among the 13 unclassified cross absorbed with our scarlet Type IV group, and 1 with our scarlet Type I group. We also found that 2 strains out of 29 from meningitis cases in New York City, 1 strain from pneumonia blood, and 1 from pneumonia sputum out of several cases at Harlem Hospital, fell into our E Type I group.

The finding of this definite relationship between certain strains from erysipelas and certain from scarlet fever might have been predicted from the recorded instances of clinical relationship between the two conditions so labeled. That Birkhaug did not find a relationship to scarlet fever strains is explained by the fact that he worked with a comparatively few scarlet fever strains, these possibly falling into our Type Sub I group (our largest scarlet fever group), or into some other group. That the B 3 group—our E Type II—subacidus strains, escaped him is harder to understand, since we have found that this is an extremely clear-cut group. The agglutinated bacteria are always sharply differentiated in the brilliantly clear serum and the absorptions or non-absorptions with the strains are complete—no lowering of the titer unless it is completely lowered; that is, these 4 strains of E Type II stand out as giving no evidence of sub or lateral varieties up to the time of writing. Moreover, these strains rather easily gave good stable suspensions for antigens, while we have had some difficulty in getting usable antigens from most of the other strains from erysipelas.

Another interesting fact we discovered might explain why some non-comparable results have been reported. One of the strains given us by Birkhaug, C 63, the one that had not fallen into any of our

agglutinative groups, we used to obtain another serum, with the object of finding a new agglutinative group among the strains that remained ungrouped. What was our surprise to find that this strain contained only common agglutinogens for all of our type strains from scarlet fever, as well as for E Type I strains. Only E Type II strains did not absorb from it. One strain from scarlet fever—68[2]—that had not fallen into any group, we found to have the same characteristic. The cross absorption test is shown in Table I. Other members of the different groups showed similar reactions.

TABLE I

STRAIN OF HEMOLYTIC STREPTOCOCCI FROM ERYSIPELAS SHOWING ONLY COMMON AGGLUTINOGENS

Absorbed Serum	Absorbing Strains	Serum Strain	Agglutinations							Antigen Control
			100	200	400	800	1,600	3,200	6,400	
C 63		C 63							−	−
C 63	C 63	C 63	−	−	−	−	−	−	−	−
C 63	C 3 (E F)	C 63	−	−	−	−	−	−	−	−
C 63	55[4] (S Sub I)	C 63	−	−	−	−	−	−	−	−
C 63	115 (S I)	C 63	−	−	−	−	−	−	−	−
C 63	114 (S II)	C 63	−	−	−	−	−	−	−	−
C 63	57[3] (S III)	C 63	−	−	−	−	−	−	−	−
C 63	28[1] (S IV)	C 63	−	−	−	−	−	−	−	−
C 63	B[3] (E II)	C 63	+	+	+	+	+	+	−	−
C 63	C[14] (E II)	C 63	+	+	+	+	+	+	−	−
C 63	C[65] (E II)	C 63	+	+	+	+	+	+	−	−
C 63	E 9 (E II)	C 63	+	+	+	+	+	+	−	−
C 63	68	C 63	−	−	−	−	−	−	−	−
C 3	C 63	C 3 (E I)	+	+	+	+	+	±	−	−
B 3	C 63	B 3 (E II)	+	+	+	+	+	+	−	−
55[4]	C 63	55[4] (S Sub I)	+	+	+	+	±	−	−	−
115	C 63	115 (S I)	+	+	+	+	±	−	−	−
114	C 63	114 (S II)	+	+	+	+	±	−	−	−
57[3]	C 63	57[3] (S III)	+	+	+	+	+	−	−	−
28[1]	C 63	28[1] (S IV)	+	+	+	+	+	±	−	−
68[2]	C 63	68[2]	−	−	−	−	−	−	−	−

Thus we have 2 strains that are of low grade in agglutinogens. Whether they were "degraded" in the stock cultures or whether they were colony degradents from the time of isolation we cannot say. We had only the 1 strain from Birkhaug, and while from our own 68[2] scarlet fever we fished 2 colonies, the other 1 had been discarded long before. Andrews[5] states he found that about 50 per cent of his colony strains from certain cultures of the salmonella group stimulated only group agglutinins. Krumwiede and Cooper[6] in investigating this observation found that they sometimes could get only 1 in 100 colonies that showed this phenomenon. If such a strain as C 63 had been the first to be chosen by any worker, and cross absorptions had not been done,

he would have found a large group of "related" hemolytic streptococci by "agglutinin absorption."

We see then that we have found 1 comparatively large agglutination group among the erysipelas strains, 1 small one and several strains related to our scarlet fever strains, while there still remains quite a large group not belonging to any of the above, as yet unclassified by absorption of agglutinins. Moreover, we found several strains from sources other than erysipelas falling into E Type I group. We realize that this is a comparatively small number of strains. In a larger series, or in a series obtained in other parts of the world, we would no doubt get a different percentage in the groups, and find other groups.

Our percentage of strains falling into Birkhaug's big group is decidedly smaller than his—46.9 against his 91.2 per cent. In our second group there are 12.5 per cent of strains. Then we have 9.4 per cent in our scarlet fever groups, and our unclassified strains make up 31.2 per cent. We have so far found 4 strains out of about 100 tested from sources other than erysipelas that fall into our E Type I group, while 3 scarlet fever strains cross absorb with 3 erysipelas strains. This makes about 7 per cent of strains from sources other than erysipelas that are related to erysipelas by agglutinin absorption against Birkhaug's 20 per cent.

THE PROTECTIVE ANTIBODIES AGAINST THE WHOLE ORGANISMS ("ANTIENDOTOXINS")

We have found that on the whole these antibodies run with the agglutinins in specificity, that is, we have found no marked cross protection between the groups, and no cross protection with scarlet fever strains and other strains that do not fall into the groups.

For this reason and because the chief lesion in erysipelas is probably due to the endotoxins, we should have these antibodies in our serums as well as, and perhaps more than, the antitoxins.

EXOTOXIN PRODUCTION

All of the strains chosen as type strains of the different groups, and many of the individuals in the groups, as well as many other strains tested, have each produced exotoxin in variable degrees. Several have produced an exotoxin as strong as did most of our scarlet fever strains, but the majority do not.

We have tested the toxins of EC 3 and EB 3 on a large series of children between the ages of 3 and 10 years in comparison with our standard toxin with the results shown in Table II.

Birkhaug claims that the toxin of his erysipelas strains gives a

significant skin reaction in people susceptible to erysipelas and in those just coming down with the disease. But we have found no definite evidence of this. On a series of patients tested soon after they entered the hospital with 2 skin-test doses (as far as we were able to determine) each of 3 toxins—one our scarlet fever standard toxin, and the other two—EC 3 and EB 3—from erysipelas, we obtained irregular results which are given in Table III.

Of course, the question of determining the correct skin-test doses is a difficult one. The effect of serum given the same day, or 24 hours before the skin test, was in this series of cases not apparent. If the chief lesion in erysipelas is due to the "endotoxins" we would not necessarily expect a markedly regular skin-test dose.

It is easy to obtain a strong antitoxin against an exotoxin of any strain, but to show the specificity of this antitoxin in human beings is another matter. It is a question primarily of the complexity of the toxins and of the dosage. We have recently[4] called attention to this complexity first clearly brought out by Park[5] in 1925.

We have tested several erysipelas toxins besides B 3 and C 3, each on a small series of children, against our scarlet fever serums and against scarlet fever convalescent serum. We have also tested our scarlet fever toxins against erysipelas antitoxin, and found cross neutralization in the majority of children tested. For this reason as far as the exotoxic activity of these strains is concerned we infer that an antitoxin stimulated by the exotoxin of any strain, be it from scarlet fever, meningitis, erysipelas or any other disease process, would, if strong enough, protect against further injury by the exotoxins of most strains in most people.

The clear-cut analysis by McCann[6] of alternate cases of erysipelas treated with erysipelas antitoxin and scarlet fever antitoxin gives evi-

TABLE II

COMPARATIVE RESULTS ON CHILDREN OF STANDARD TOXIN DOSES OF "SCARLET FEVER" AND "ERYSIPELAS" EXOTOXINS

Number of Children 86	Results of 2 Skin Test Doses		
	Scarlet Fever Toxin (Standard)	E Type I Toxin	E Type II Toxin
12	+	+	+
18	+	+	−
10	+	−	−
4	+	−	+
12	−	+	+
4	−	−	+
4	−	+	+
22	−	−	−

TABLE III

RESULTS OF 2 STANDARD TOXIN DOSES OF "SCARLET FEVER" AND "ERYSIPELAS" EXOTOXINS ON ERYSIPELAS CASES

Toxins	No. Tested on Days Ill																			
	1		2		3		4		5		6		7		8		9		10	
	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
EB 3	0	2	5	2	6	11	5	6	2	7	5	2	3	2	1	1	1	4	1	3
EC 3	0	2	1	6	5	12	3	8	3	6	2	5	2	3		2	2	3	2	2
Sc. F. 55	0	2	0	5	2	14	2	9	3	6	1	6	2	3		2	2	3	1	3

Toxins	11		12		13		14		15		16		20		21		23		35	
	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−
EB 3	1	1		2		1		1		1		1		1	1	1		1	1	0
EC 3	1	1		2		1		1		1		1		1	1	1		1	1	
Sc. F. 55	1	1		2		1		1		1		1		1	1	1		1	0	1

23 of the 82 cases had no serum.

dence in favor of the hypothesis that antitoxic serum alone is not sufficient to give significant results in curing erysipelas.

Unfortunately we have as yet had no practical application of the comparative worth of antitoxic against antibacterial serum. Symmers's cases[7] were treated with a serum having presumably both antitoxic and antibacterial antibodies, but we do not know the absolute or relative strength of those antibodies since no tests of their titer were reported. Neither were they reported for Birkhaug's serum.

Since none of the three serologic tests described—the agglutination test, the protection test against endotoxins, and the exotoxin neutralization test—shows one definite erysipelas group, the name *Streptococcus erysipelatos* seems to be without specific significance, and might be dropped with the name *Streptococcus scarlatinae* as a species name, for the present at least, in favor of the name *Streptococcus hemolyticus* with the designation of the agglutinative type following it.

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NOTE. A group of workers in our Bureau of Laboratories have been giving material assistance in this work. Chief among them are M. C. Schroder, C. R. Gurley, F. Berman, A. Brassel, P. Seiler and J. B. Ruhl.

An Improvement in the Quantitative Assay of the Antiscurvy Vitamin (C)*

WALTER H. EDDY, PH. D.

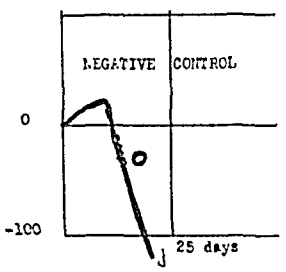
Department of Physiological Chemistry, Teachers College, Columbia University, New York, N. Y.

WHILE the experimental data presented in this paper have to do with a review of present methods of evaluating antiscorbutics and the claims of Höjer's methods as contrasted with the Sherman method (now generally in use in the United States), the subject has a very direct bearing on health problems and practices, for the method of Höjer assumes a very specific response of teeth to presence or absence of vitamin C. That this response is specific and supports the suggestions for dental nutrition practice, first emphasized by Dr. Percy Howe and more recently by Hanke and Wells, will appear as we outline our experimental findings obtained in parallel studies of vitamin C assay methods.

The Sherman method[1] was first presented in 1922. LaMer, working with Sherman and Campbell, developed a diet for guinea pigs which was markedly superior to the hay-oats-water diet, up to that time generally used to produce experimental scurvy in these animals. Its superiority was based on evidence, considered satisfactory at the time, that it contained all the nutritional factors necessary for normal growth except vitamin C. Guinea pigs of 300 gm. on this diet developed acute scurvy and died of that disease in from 25 to 30 days. The smallest amount of addendum necessary completely to prevent scurvy for a period of 90 days when added to this diet in daily doses, was called the minimum protective dose, and since that dose was inevitably expressible only in amount of food carrying the same, Sherman's unit quantity of antiscorbutic, like that of Holst, was defined as the smallest quantity of food source necessary to total absence of scurvy symptoms in a 90-day test using guinea pigs and the above basal diet.

Since 1923, Kohman and I have used the Sherman method[2] in studying a wide range of fresh and canned vegetables and fruits.

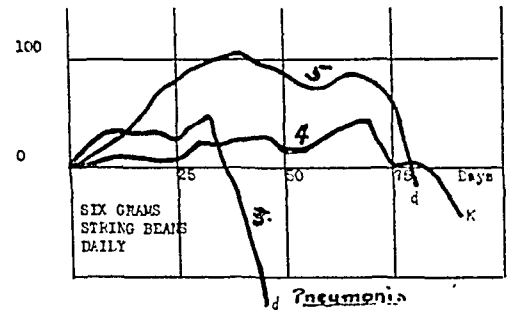
* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.



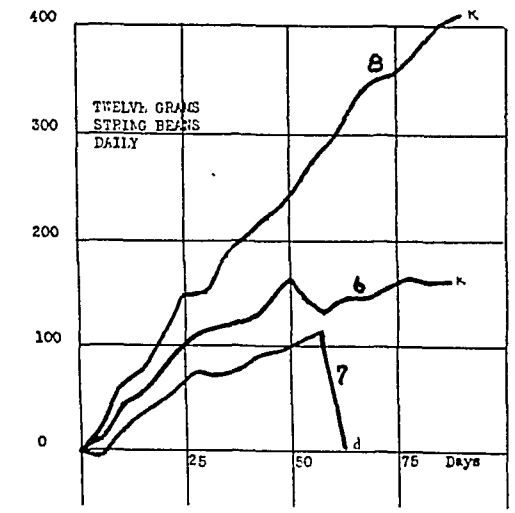
Brittleness	Pig 0.
Bones	***
Jaw	***
Teeth	***
Beading	***
Hemorrhages	
Muscle	***
Joints	***
Ribs	***
Intestines	***

BASAL DIET USED

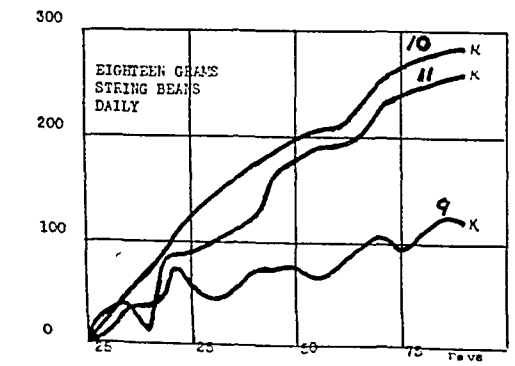
ROLLED OATS	50 PARTS
WHEAT BRAN	9 PARTS
BAKED SKIM MILK PWD.	30 PARTS
BUTTER FAT	8 PARTS
COD LIVER OIL	2 PARTS
SODIUM CHLORIDE	1 PART
TOTAL	100 PARTS



Brittleness Pigs	3	4	5
Bones	*	*	*
Jaw	*	*	*
Teeth	*	*	*
Beading	*	**	*
Hemorrhages			
Muscle	*	*	*
Joints	*	*	0
Ribs	*	*	*
Intestines	*	0	0



Brittleness Pigs	6	7	8
Bones	*	*	0
Jaw	0	0	0
Teeth	0	*	0
Beading	*	*	0
Hemorrhages			
Muscle	*	*	*
Joints	0	*	0
Ribs	0	*	0
Intestines	0	**	0



Brittleness Pigs	9	10	11
Bones	*	0	0
Jaw	0	0	0
Teeth	0	0	0
Beading	0	0	0
Hemorrhages			
Muscle	0	0	0
Joints	0	0	0
Ribs	0	0	0
Intestines	0	0	0

FIGURE I—A TYPICAL SHERMAN-LAMER TEST. Weight curves are shown of guinea pigs on various intakes of canned string beans and also the autopsy scores of each of the pigs on these diets. By this method we obtained complete protection from scurvy symptoms on a dosage of 18 gm. of canned string beans daily. In this series we used the basal diet given.

Statistically our numbers of test animal records now run into the thousands and provide material for some comparative observations of interest and profit. During the past year, therefore, my laboratory has devoted considerable time to such critical review of existing data and, through the coöperation of Dr. Gilbert Dalldorf of the Department of Pathology of the New York Hospital, we have extended our review by new experiments aimed to evaluate criticism of the Sherman method and of some of the substitutes offered, notably that of Höjer.[8]

IS THE ORIGINAL SHERMAN-LAMER BASAL DIET COMPLETE IN ALL GROWTH FACTORS EXCEPT VITAMIN C?

Their basal diet as given in 1922 consisted of the following:

	Per cent
Ground whole oats	59
Baked skim milk powder	30
Butterfat	10
Salt (NaCl)	1

We are using today the following modification of this diet:

	Per cent
Baked skim milk	30
Butterfat	9
Salt	1
Rolled oats and wheat bran (½ & ½)	59
Cod liver oil	1

plus a certain amount of yeast fed separately.

The bran was added to supply roughage in greater quantity, the cod liver oil as insurance against vitamin D deficiency, and in certain cases we had direct evidence of lack of one or more of the vitamin B factors, making yeast of value in supplementing the oats and milk content of these factors.

Sherman introduced a scurvy symptom score based on autopsy findings. Figure I shows the nature of this score and its use in determining minimal protective dosage of a tested antiscorbutic.

In spite of score and correction of basal diet defects the test has been criticised. The experimental pathologists took a hand in the matter. In his treatise on "Scurvy," Hess has adequately summarized the pathology of the disease up to the date of publication (1920). So far as I can find, Jackson and Moore,[4] 1916, were the first to note scorbutic changes in teeth. These observations were confirmed by Zilva[5] in 1919, but greatly extended by Höjer[3] in 1924. Aschoff and Koch[6] in 1919 also turned their attention to the pathology of scurvy,

and it is their viewpoint as to the function of vitamin C that led to the theory advanced by Wolbach and Howe[7] in 1926. We will return shortly to this work of Wolbach and Howe and their theory. From the viewpoint of methodology in assay, the work of Höjer especially concerns us. This Swedish pathologist supplemented his first studies, published in 1924, by a scheme for utilizing tooth pathology as a quantitative measure of antiscorbutic value. His scheme was published in detail in 1926.[8] It was critically reviewed by Goettsch and Key[9] in 1928. The following quotations from the 1926 paper of Höjer explain briefly why this scheme constitutes both a challenge of the Sherman method and a claim for efficiency requiring study:

> Sherman and others, in 1922, therefore proposed to limit the experimental time to 70 or 90 days and then to make a macroscopic post-mortem examination to make sure that there were no internal hemorrhages or other signs of scurvy. Sherman also introduced the rating of the scorbutic signs in animals which were not fully protected, and thus he estimated the dose of antiscorbutic given in quarters of the fully protective dose. Even with these improvements of Sherman's this method of determining the fully protective dose is very inaccurate, and often gives variations of 100 per cent or more.
>
> . . .
>
> Naturally a biological method cannot afford the accuracy or the simpleness of a chemical one. It is indeed the lack of a chemical method for the determination of the antiscorbutic value that has called in experimental pathology as a temporary aid to the physiologist. As a biological method, and in comparison with that hitherto used, my method has the following advantages: First, it is accurate in fixing the fully protective dose. This is of value particularly in physiological work. Secondly, the method requires only 3 weeks instead of 3 months. This is an essential factor in hygienic work. Lastly, being shorter, it is more economical than the older methods.

What is this method? In brief it rests on the claim that the teeth show specifically in 3 weeks or less the absence of an adequate amount of vitamin C in the diet. Höjer's own description[8] of his technic follows:

> As previously, young guinea pigs from a certain day on are given a basal diet free from antiscorbutic, but otherwise complete, and to this diet are added quantitatively daily doses of the juice to be examined. For a sharp determination of the fully protective dose it is advisable to have several animals on different doses. In addition there ought to be two control animals on the basal diet alone, and two on the basal diet with a fully protective dose of a known antiscorbutic. After a period of 10–14 days all the animals are killed. The one-half of the lower jaw is taken out and decalcified in a 5 per cent tri-chloracetic acid solution. It is then embedded and sectioned after 1 week. The section is made through the foremost molar at right angles to the longitudinal axis of the jaw. Some sections are stained with hematoxylin-eosin, and others with tri-oxyhematin according to the method of Hansen.

Such sections according to Höjer not only reveal histological pictures characteristic of scurvy or its absence, but it is possible from pictures of partially protected animals to predict the fully protective dose, as shown in Table I.

TABLE I

DETERMINATION OF THE ANTISCORBUTIC VALUE OF FOOD BY HÖJER'S METHOD[8]

	Part of Protective Dose
1. Dentine of normal size; its inner and outer layer uniformly colored; predentine regular, uncalcified; dentine and predentine holding collagen—	
a. Odontoblasts long, slender, parallel, of equal height	1.0
b. Odontoblasts partly shorter	0.9
2. Dentine very thin, uniformly colored; odontoblasts parallel, short	0.8–0.3
(The degree of osteoporosis, hyperemia and collagen permits the distinguishing of different stages, but not very sharply. Those animals whose dentine formation seems to have been arrested are therefore excluded.)	
3. Dentine in inner and outer layer differently colored.	
a. Odontoblasts on the larger pole of the incisor cross-section short and parallel	0.8–0.3
(1) The Tomes' canals going parallel through a normal predentine	0.8
(2) The uncalcified predentine defective formation of network bone beginning	0.7
(3) Uncalcified predentine lacking	0.7–0.5
(4) Network bone formation greater	0.4
(5) Tomes' canals in the old dentine widened	0.3
b. Odontoblasts on the larger pole of the incisor cross-section no longer in continuous layer	(0.3–) 0.2–0.0
(1) Tomes' canals in the outer layer of new bone	0.2
(2) No Tomes' canals in the new bone, osteoporosis and hyperemia well developed	0.1
(3) The old odontoblasts in greatest disorder, osteoporosis and hyperemia very evident	0.0

A tooth section showing the picture 3, a, (1), with 0.5 gm. of antiscorbutic daily would permit prediction that the fully protective dose of that antiscorbutic would be 0.622 gm. (0.5 gm. $=$ 0.8x).

The value of Höjer's method obviously depends upon substantiation of claims for specificity. Do the tooth changes he reports result solely from the absence or inadequacy of vitamin C in the diet? Are they affected in any measure by absence or presence of vitamin D? Can we rely on the pictures of partial protection he presents to predict full protective doses?

To date two critical studies support his claim that tooth changes picture specific and early response to absence or inadequacy of vitamin C.

Goettsch and Key[9] have reported comparisons of Höjer's method with the older type. They studied particularly the question of whether the tooth changes noted had any correlation with symptoms of rickets and found none. The actual tooth changes were as de-

TABLE II

TABLE AFTER GOETTSCH AND KEY[9]

No. Guinea Pigs	Line Test	Blood serum mg. Ca per 100 c.c.	Mg. P per 100 c.c.	Per cent ash of dried and extr. femurs	Diagnosis
18	No rickets	9.9	5.8	59.4	Death by scurvy
24	"	11.3	5.3	55.0	"
28	"	12.0	5.3	57.9	"
35	"	9.4	5.0	56.2	Partly protected by 0.5 c.c. orange juice
36	"	10.1	5.0	57.4	Partly protected by 0.5 c.c. orange juice
38	"	10.9	5.0	59.0	Partly protected by 0.5 c.c. orange juice
31	"	9.8	5.0	54.2	Completely protected by 3 c.c. orange juice
32	"	9.1	5.0	56.2	Completely protected by 3 c.c. orange juice
34	"	9.0	4.5	56.2	Completely protected by 3 c.c. orange juice

scribed by Höjer and in their hands confirmed his criticism of the Sherman method, for whereas the Sherman method fixed 1.5 c.c. as the protective dose for orange juice, prevention of the scorbutic symptoms in teeth required a daily dosage of 3 c.c. of orange juice. Their only stricture is the reliability of prediction from the results with partially protected animals and they feel that individual variation in animals calls for fairly large numbers on these intermediate tests if the predictions as to full dosage are to be relied upon.

Wolbach and Howe[7] gave more attention to Höjer's histology and his theory of its cause than to his use of the study of antiscorbutic testing. They say:

> We do not question the accuracy of Höjer's description. His findings are different in important respects from ours, as we found in the state of complete scorbutus no formation of " osteodentin " or pulp bone. We believe that his diets were not completely deficient, because we obtained both conditions answering to his descriptions only in guinea pigs fed alternately on deficient and normal foods. . . . Our results corroborate completely and extend the deductions of Aschoff and Koch, so that we characterize the scorbutic state as one due to the inability of cells of supporting tissues to produce intercellular substances and to maintain existing intercellular substances.

Later in their paper[7] they further hold that Höjer's theory to account for changes as due to degeneration or the change of odontoblasts to osteoblasts is not proved. Rather they consider that the odontoblasts do continue to function, but through lack of a substance supplied by vitamin C their proliferated " jell " fails to set into dentine.

> . . . We therefore advance the theory that the failure of cells to produce intercellular substance in scorbutics is due to absence of an agent common to all supporting tissues which is responsible for the setting or jelling of a liquid product.

The immediate purpose of the present paper is to make clear the possibilities offered by the Höjer test for rapid assays of antiscorbutic values and to present evidence from our own studies of its validity. To that end we have devoted considerable time during the past year to checks and comparisons with our previous assays and also some study of material hitherto unpublished. We report here three such specific comparisons.

I. CANNED STRING BEANS TESTED BY BOTH METHODS

In Figure I is presented a series of studies of canned string beans by the Sherman method. Using both growth curves and scoring system this study showed 18 gm. of canned string beans per day to be the minimum protective dose. This series was then repeated using the Höjer procedure in part. Figure II represents tooth sections obtained in this study.

Photograph A of Figure II shows a magnified tooth section from an animal receiving 18 gm. string beans daily at the end of 30 days on the diet. (This was the protective dose by the Sherman method.) Even in this period the beginnings of scurvy are evident, though slight. The odontoblasts are irregular and beginning to separate from the dentine. A layer of jelly is beginning to form. Photograph B shows a much more distinct disturbance in tooth structure. The period on diet is the same (30 days), but the dosage of antiscorbutic was only one-third as much (6 gm. string beans daily). True dentine is markedly reduced. The odontoblasts are very irregular and have formed much false dentine. This material was partly bone-like, tending to support Höjer's claim that the character of the odontoblast output is actually changed in quality.

Photograph C is given to show the odontoblasts in higher magnification, and photograph D shows that the effect of inadequate antiscorbutic was already manifest in 20 days on the diet. With this method we were unable to reach a dosage of string beans that completely protected teeth. Even 18 gm. per day had already become difficult to use without reduction of the basal intake below efficiency in other factors.

The series shows clearly, however, that if the tooth is a true index of antiscorbutics, it is a much more sensitive one than the Sherman scoring system; that tooth protection demands more antiscorbutic than does the prevention of external symptoms of scurvy. This particular study definitely confirmed the claims of Höjer and others that the guinea pig's tooth responds very promptly to variation in vitamin C.

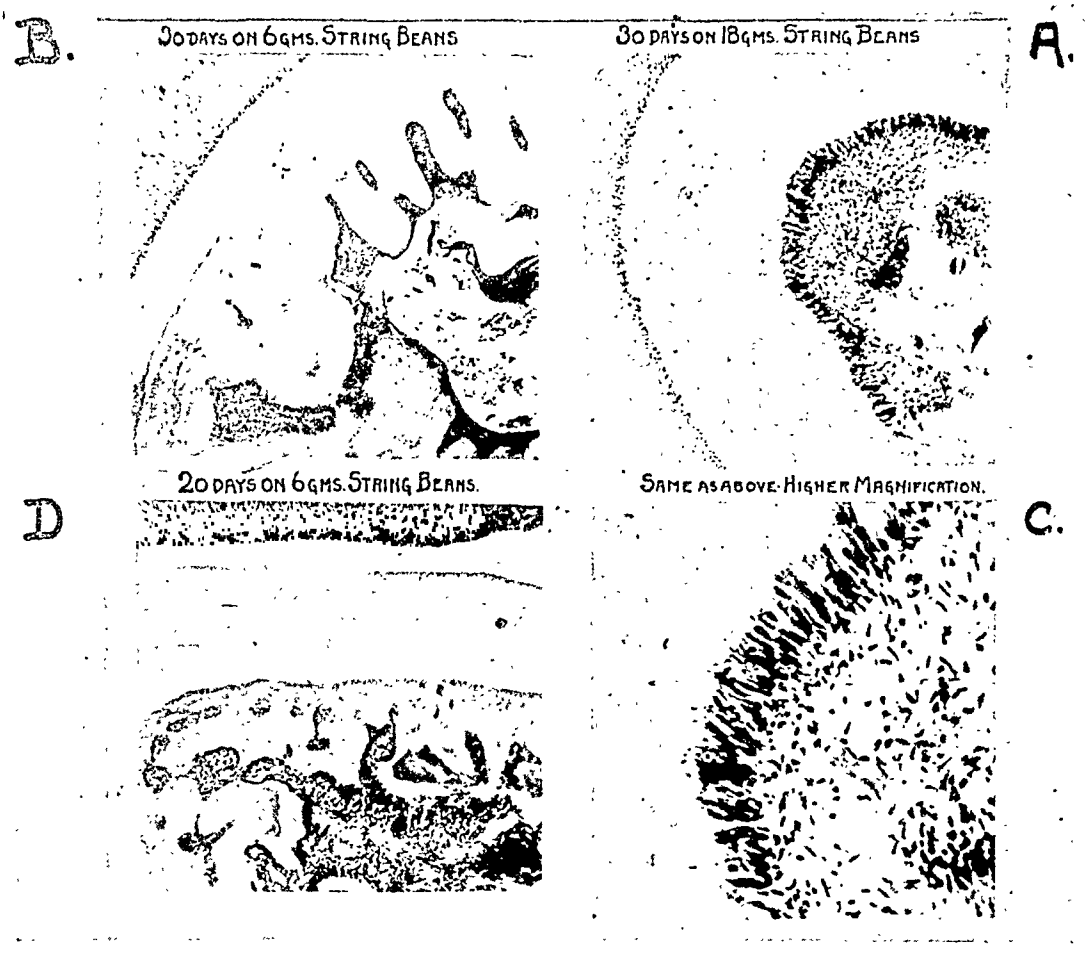


FIGURE II—TYPICAL HÖJER TEST RESULTS

In this series tooth sections were made at the end of 20 and 30 days on basal diet plus different intakes of canned string beans. Photographs A, B, C, and D are microphotographs of tooth sections from typical animals.

Photograph A—This shows the tooth of a guinea pig that had received for 30 days a daily dosage of 18 gm. canned string beans. The tooth shows slight scurvy. The broad band of dentine is separated from the cells which form it (odontoblasts) by a narrow band of jell-like material.

Protograph C—This shows a region of the section given in A highly magnified to show the soldier-like row of odontoblasts, the dentine with its fine striations of Tomes canals and the beginnings of the separation layer between odontoblasts and dentine.

Photograph B—In contrast to the above note in this section the very narrow band of dentine, the complete confusion of arrangement of the odontoblasts, the soldier-like rows are gone and the cells are in irregular islands in the pulp cavity. Between islands and dentine is a mass of semi-solid jell quite unlike true dentine. This effect was produced by inadequate antiscorbutic, 6 gm. canned string beans instead of 18 gm. daily.

Photograph D—Note that even in 20 days the effect of inadequate antiscorbutic is plainly evident.

II. ORANGE JUICE SERIES

During the past year we were asked to compare the antiscorbutic value of California and Florida oranges. Picking by size in the open market we carried out the regular Sherman test. Both types proved by this method fully protective in daily doses of 1.5 c.c., neither showing any appreciable superiority as an antiscorbutic over the other. This series, however, also permitted us at the same time to check Goettsch's[9] criticism of Höjer's method as well as to compare again Höjer's method with Sherman's in our laboratory. The check with Goettsch was remarkably good. In our hands 3 c.c. of either California or Florida orange juice was necessary to prevent tooth changes characteristic of scorbutus, exactly the relation obtained by Goettsch in her comparison (see Figure III, photographs A and B).

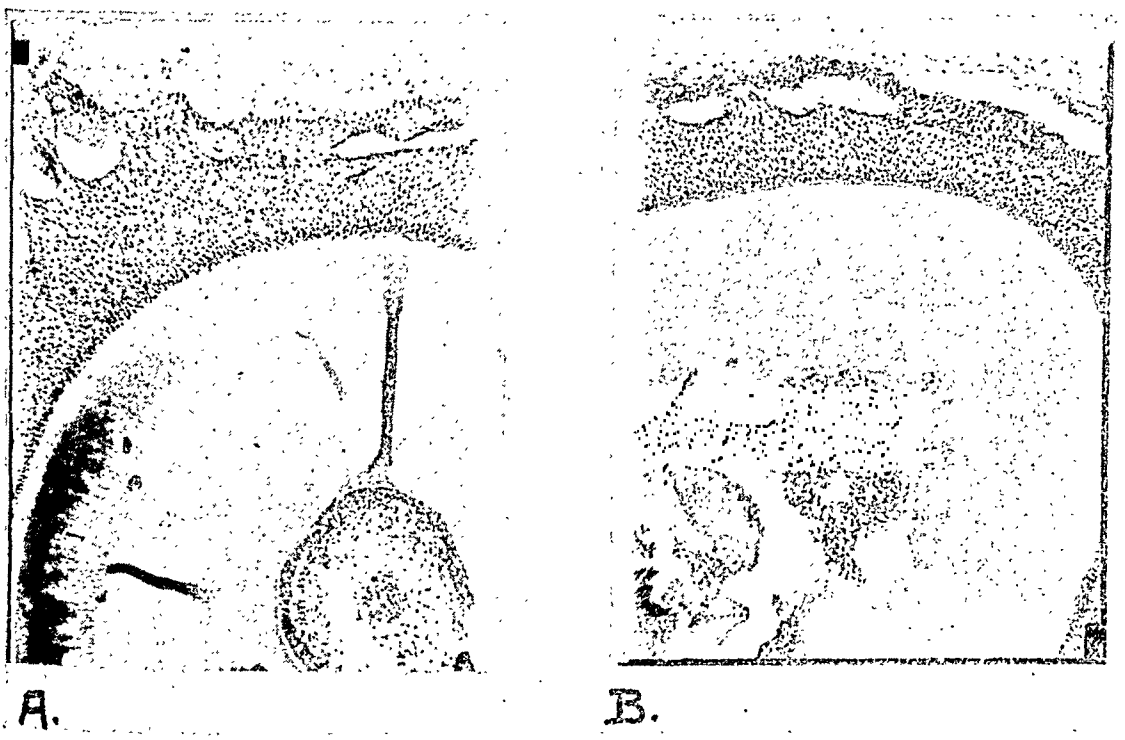


FIGURE III—THE EFFECT OF ORANGE JUICE ON TOOTH FORMATION

Photograph A—Tooth section from guinea pig on 3 c.c. of orange juice daily for 20 days. Note normal thick dentine, perfectly regular row of odontoblasts in direct contact with lower edge of dentine.

Photograph B—Tooth section from guinea pig on only 2.5 c.c. of orange juice daily for 20 days. Note that 0.5 c.c. difference is plainly shown in disturbance of tooth structure. Odontoblasts have become irregular and begun to separate from dentine.

The tooth therefore is quickly responsive to very slight differences in antiscorbutic dosage.

III. BANANA ANTISCORBUTIC VALUE BY HÖJER METHOD

In 1926[10] I reported to this Association a study of the antiscorbutic value of the banana. Five gm. daily was the minimum protective dose determined by the Sherman method at that time. We have now retested the banana by the Höjer method. In doing it we introduced a modification suggested by Dr. Wolbach, that is, to include as positive controls in each series one animal fed for 5 days on a recognized adequacy of antiscorbutic following his 16 days on the banana intake. This procedure enables one to judge with more exactitude as to when the fully protective intake is reached. Figures IV and V show the tooth results.

Exactly as in the case of orange juice, the antiscorbutic dose of banana for tooth protection was found to be double that previously obtained as minimum protective dose by the Sherman method, 10 gm. instead of 5 gm. It seems hardly possible that this ratio is entirely fortuitous. If further tests establish it as the true difference between tooth and general body requirements it will be a simple matter to convert antiscorbutic values that have been reported since the general adoption in this country of the Sherman method into tooth protective values. We will need only to multiply by two.

What the true values are in terms of teeth obviously requires much more extended study. I believe, however, that the results reported herewith justify considerable faith in the Höjer method, and its speed, its relative simplicity, its greater freedom from the danger of contaminating disease factors in the longer test all commend it to our careful appraisal.

The facts on which the Höjer method rest have a wider significance in public health procedure. Scurvy, in fact, is still a relatively rare hospital disease when diagnosed by the usual signs. *If tooth health is so directly related to vitamin C content of diet as these studies imply,* we must not only give more antiscorbutic, but greater quantities for tooth health alone. Hanke[11] reported at the recent International Physiological Congress in Boston studies that confirm this view: He studied 100 cases, afflicted with every type of dental disorder, in subjects ranging from 4 to 60 years of age. He found the diets not markedly lacking in vitamin D, but *40 per cent were markedly deficient in vitamin C.* He says:

> It is possible, by means of a diet containing an abundance of vitamin C, to produce solid gum tissue, to arrest caries and, with the aid of prophylactic measures, to cure pyorrhea and induce bone regeneration in the alveolar tissue.

This view of Hanke's has been urged with much emphasis by Dr. Percy Howe.

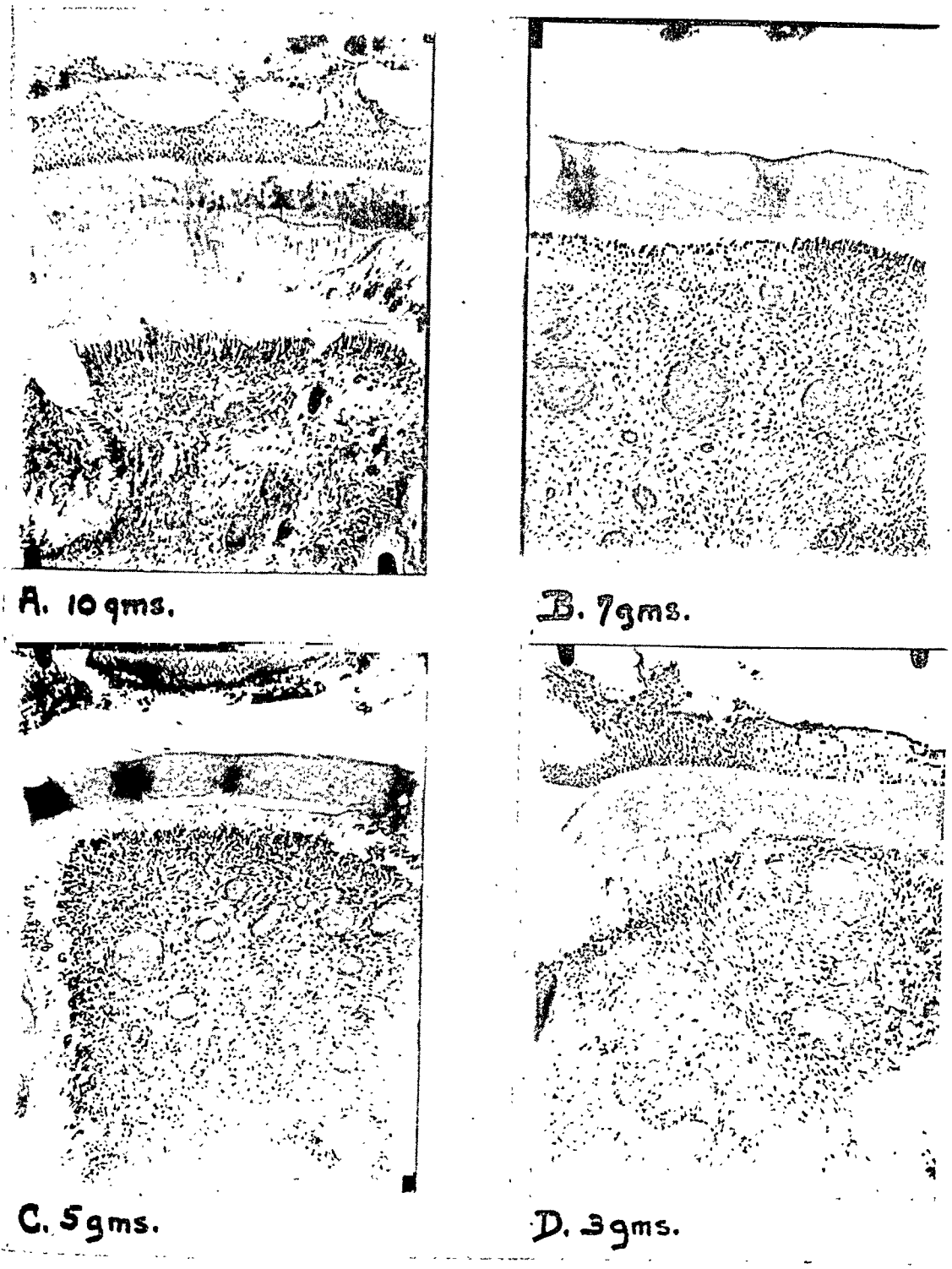


FIGURE IV—THE BANANA AS AN ANTISCORBUTIC

A—Ten gm. banana daily completely protective to teeth.

B—Seven gm. banana daily insufficient. Reduced dentine, odontoblasts still in regular rows but separated from dentine.

C—Five gm. banana daily gave still less dentine and beginning of irregularity in odontoblasts. This is the minimum protective dose by Sherman Method.

D—Three gm. banana daily shows complete derangement of odontoblasts.

As in the case of orange juice tooth protection requires double the amount of anti-scorbutic per day as was shown adequate against general scurvy symptoms by Sherman test and score.

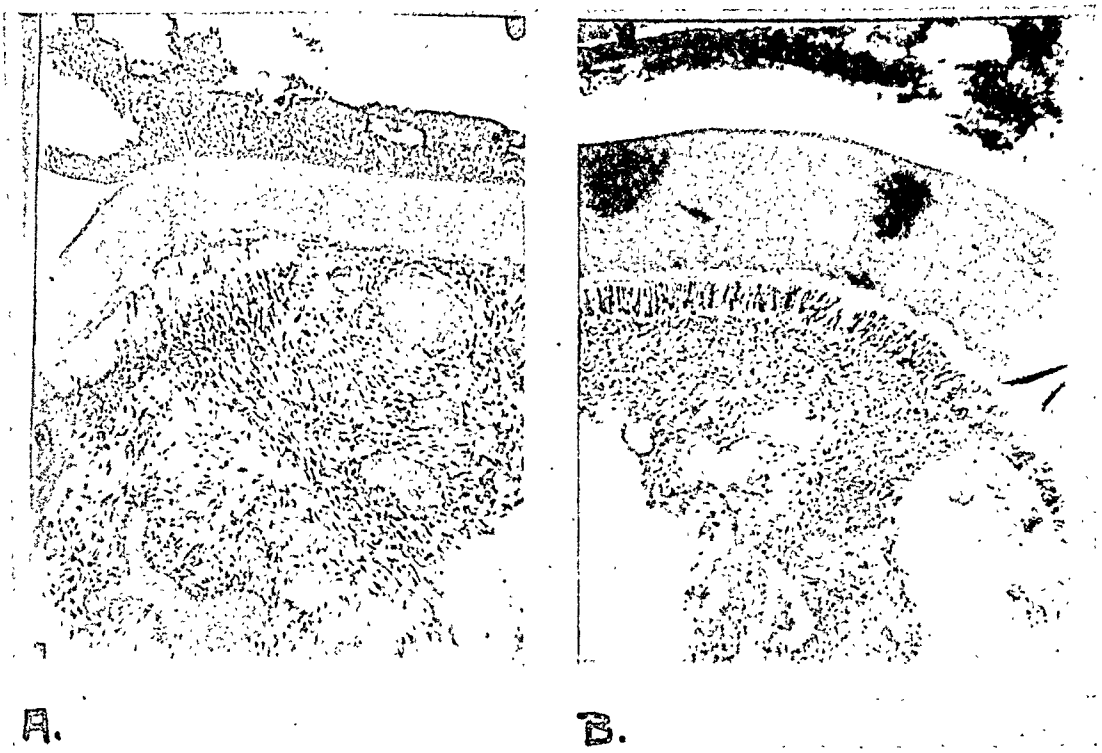


FIGURE V—SHOWS SPEED OF SCURVY CURE WHEN ANTISCORBUTIC IS ADEQUATE

A—Section of tooth of guinea pig on only 3 gm. of banana per day at the end of 21 days.

B—Section of tooth of another test animal who was fed 3 gm. banana daily up to the 18th day and then placed on a diet with completely adequate dosage of antiscorbutic for 5 days more.

Note contrasts. Five days had restored regularity to odontoblasts and brought about formation of a considerable amount of new dentine. See line of separation between new and old dentine.

With all the attention that vitamin D is receiving as a bone-former today, and by inference as affecting tooth formation, it is at least significant to find that the major tooth forming factor is quite a different vitamin, and of value to recognize this fact in applying dietary measures to tooth health.

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Training Teachers in Health Education*

ELMA ROOD, R. N.

Professor of Nursing Education, George Peabody College for Teachers, Nashville, Tenn.

THERE is increasing recognition, on the part of workers in child health, of the tremendous influence which the classroom teacher has in encouraging good health habits, influencing the child's attitudes and desires, contributing to his ability to coöperate intelligently, and stimulating a real enjoyment in the building and maintaining of a fine, strong body. The more progressive schools are now initiating their own health programs, and are calling on specialists for assistance according to the needs of the children. This places the teacher in the strategic position of determining to a large extent what these needs are. It is therefore evident that the results obtained in any school health program will largely be determined by the teacher's education in health. The most crucial point in which to give this instruction is in the plastic stage of the first years of teacher training.

Teachers' colleges and normal schools are vocational, presumably preparing young people to administer education, to build citizens. Among their responsibilities in realizing the objectives of education, the health of children takes a prominent place.

The problems which confront the person who is preparing these young teachers to assume this responsibility are three: first, the basic training and experience given on the college campus; second, the observation and practice afforded in the demonstration school as the testing ground of all theory previously taught; third, the field itself in which the student finally proves the value of instruction received. The problems of teacher training in health will be discussed from these three standpoints.

The conditions surrounding life on the campus loom very large in any consideration of education of a student in health. What he is experiencing daily is being written into his consciousness in vivid terms in comparison with the impression made in many class periods. Much of his experience is definitely connected with his environment,

* Read at a joint session of the American Child Health Association and the Child Hygiene and Public Health Education Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

which, beside being a silent force in education, should also be a reservoir of opportunities for teaching health actively. The public health supervision of the campus should exemplify the very best practice of scientific principles, and should be several leaps ahead of many fields in which the student will work in the future. In other words, it should set the pace in the development of healthful programs for pure water, food supervision, garbage disposal, good ventilation, sanitary cleaning methods, and communicable disease control.

The college campus in reality represents the problems of a small community, where the students are learning positive principles of public health administration which will later be translated into the practices of their communities. A teachers' college in which this vast field of learning is used to its fullest, should be able to pass creditably a survey of fountains, lavatories, water and milk supply, cafeteria, garbage disposal, dormitories, infirmary, and general conditions of cleanliness on all parts of the campus and in all buildings.

The environmental conditions, beside furnishing valuable teaching material, directly influence the personal hygiene and health of the student body, and, as such, should be a matter of close concern of the health department of the college. It is through this department that students are initiated into the health examination, learn their own physical rating, and receive instructions as to defects, habits, and attitudes related to study, recreational activities, diet, and other important points in daily life. The way in which students are able to carry out these instructions often depends upon the environmental conditions, which may either help or hinder efforts to attain a fine standard of health, physical and mental. The college infirmary, while serving as an emergency measure, should also be an educational opportunity for students who for some reason have failed in maintaining health.

Every student should receive in his college course the essentials of personal, school, and community hygiene. The emphasis in personal hygiene should be mainly on promotion of health, with enough physiology to give a background. Credit should be given for the success which the student attains in reaching and maintaining a high degree of health. Principles developed in personal hygiene should be constantly applied, not only to the life of the adult student, but also to that of children. In school and community hygiene courses, there should be constant applications to school environment and practices. These classes should frequently visit the demonstration school to observe problems of water and milk source, food service, seating, lighting, heating, ventilating and cleaning, and should study the way in which they are met.

Beside these courses which are *directly* related to the health education of the student, biology and allied sciences, psychology, home economics, agriculture, physical education, elementary education, and school supervision and administration make important contributions to the understanding of factors which influence the physical, mental, or emotional health of children. Instructors of these courses should share the responsibility of seeing that health principles taught in their classes are actually functioning in the demonstration school.

The content of these courses should also be influenced by problems of the field to which the students will go. State and local boards of health have first-hand information of outstanding community health problems, and are eager to pass on this information to instructors in teachers' colleges. A close relationship should exist between these official agencies and the college staff. Points on which schools are having difficulty as shown by reports from the field should be brought before classes for discussion and tentative solution. For instance, a practical problem in an adjacent community may be that of scarcity of milk and fresh vegetables. Time should be given in food courses to a consideration of basic causes for such conditions. Undernourishment of children, as a common field problem, might well receive attention in courses in nutrition. Responsibility for swimming pool sanitation on the college campus and in the demonstration school, offers a practical project for science classes. In communities in which hookworm, typhoid, and tuberculosis are outstanding problems, time should be devoted to these subjects in science and agriculture.

Even though instructors in all subjects seek to bring out the important health correlations, there is still very great need for a course which shall gather together all the contributions, and show the student clearly, first, how they are significant to the health of children, and second, how they may be applied. This course should be developed in close contact with problems of the demonstration school, and those of the field to which the student will be going. Methods should be developed to fit difficult conditions, such as the rural school with few facilities, for such methods may be adapted to surroundings which are more favorable.

Students should, in this correlation and methods class, develop initiative and originality in planning and carrying out health games, dramatics, field trips with follow-up, group projects, use of current events and newspaper articles, preparation of scrap books, study of some life situations, survey of existing material for health correlations, bulletin boards, silent reading lessons, debates, discussions, demonstrations, and the use of the auditorium period for presenting

any of these. Health examinations and inspections, playground equipment, the hand-washing, and hot lunch service of the demonstration school should be observed and discussed preparatory to later participation.

Definite work should be done in correlation with the various school subjects, such as those of science, social studies, physical education, home economics, and kindergarten and primary activities, so that the students will realize the broad way in which health as a quality of living is tied up with a multitude of life situations. In other words, students should clearly see health, not as a subject bounded by arithmetic on the one hand and geography on the other, but as a condition to be reckoned with 24 hours out of the day, and which constantly presents untold opportunities for influencing the lives of children. If all young teachers could go out with this conception and a genuine enthusiasm to meet the conditions which arise, the problem of child health in our schools would be well on the way to solution.

The second aspect of teacher training for health education is found in the demonstration school, which should be a testing ground of theories taught on the campus. Upon the functioning of health in each classroom depends the impression which the student receives of the practical application of these theories. The demonstration school represents again a small community in which all the principles of public health are carried on with and by the children as far as possible, illustrating the methods of meeting such child health problems as are found in the field. Throughout, the spirit toward health as represented by the principal and teaching staff, and which brings about a real health demonstration, has an immeasurable influence upon the entire student body.

Every student participating in classroom teaching should take part in solving health problems which arise in that room. Each should study children, under the supervision of the teacher, who will utilize the service of special workers in the school. This study should include, among all other phases of the child's development, his physical basis, with as much family background and past history as possible. Such a study enables the student to individualize the child's needs in terms of physical changes, habits, and attitudes, and to make the health program a vital thing to each child.

The demonstration school should be able to measure achievements of the children in every classroom in terms of some accepted standard in health. Every room should be able to show definitely what is being done to meet its problems; how far it has gone in improving

physical conditions, in building definite health habits, in influencing attitudes and desires, in increasing the child's intelligence, and in directing and interpreting his experiences.

In comparison with theory, the demonstration school leaves a vivid impression upon the student teacher. While it is placed second in our chronological consideration of aspects of the teacher training program, it should rightfully be placed first in importance. The success of the health program in the demonstration school will determine very largely the success of the health programs of hundreds of schools in the field. The demonstration school is the keynote in teacher training for health and should represent the culmination of effort on the part of the entire college and of the health agencies in the field in influencing teachers who assume the responsibility for the health of thousands of children.

The third aspect in the development of teacher training in health is found in the field, which is the final test of the student's ability to carry out what has been learned. Every teachers' college sends hundreds of young people out into most difficult territories where there are no organized health agencies and where no immediate assistance is to be had in the solution of health problems.

To help meet this challenging situation, a plan has been tried, in at least two states, of offering these teachers an opportunity to carry out an organized health project in the field, under the supervision of the health education department of the college and on the basis of college credit. In localities where this work has been carried on, interest has been developed which has extended into other schools in that community and which in many cases has carried over in succeeding years without credit.

Up to the present, conferences in the development of the projects have been carried on at intervals at the college. As the field work grows, however, it would seem that supervision should be provided in the field, the supervisor representing to the teacher an immediate helper, consultant and adviser. This supervisor should help the teachers tie up their work closely with local health agencies, and should also help to unify the work of all contributors in the interest of the children's health. Ideally, this supervisor should serve jointly the college and the state departments of health and education.

The field reports of the supervisor should bring into the state and college departments valuable data which should guide them in future efforts. A state health standard is of great value in establishing definite objectives to guide these projects. Every worthwhile project should show some results which contribute to the attainment of this

standard. In reality, every time a teacher launches a project in the field, she becomes an active assistant in carrying on the work of the state departments in health and education. Considering the great number of teachers in the field who have direct contact with children, the total results of this type of state-wide supervision can hardly be estimated. With the possible development of the health work on a state-wide basis, it would seem that a wise provision would be to have a health coördinator who would tie up effectively the work of all departments of the college, of the demonstration school, and of the field.

Whatever may be worked out as the possible solution of this problem, there should be evident a strong development which is definitely moving through the basic sciences and health courses in the teacher training schools, on through the demonstration schools as the preliminary testing ground, out into the field where the supreme test of its value is made, and back into the teachers' college for critical analysis, reëvaluation, and re-adaptation, thus contributing rich source material for the further development of the possibilities of teacher training in health education.

Mental Hygiene Rules

NO, it is not likely that regulation of behavior can be secured by handing out a set of " rules." As a matter of fact, few " rules " of mental hygiene as yet exist. Attempts in the past to place such " rules " in the hands of school children, adolescents or adults have invariably degenerated into the quotation of time-worn platitudes, as sterile as they are absurd. " Cheer up," " Think pleasant thoughts," " Don't worry," and a host of similar admonitions in the hearty voice of the professional Pollyanna are merely depressing to some people in need of mental hygiene, but irritating to others.

Platitudes are not mental hygiene. Exhortations do not relieve maladjustments. There are no royal roads to learning in this matter. There are no short cuts to mental health.

These are some of the reasons why leaders in the field of mental hygiene discourage most well-meant attempts to create courses in mental hygiene that can be given to school children and adolescents. To impart mental hygiene effectively, both the teacher and the taught should have behind them a reasonable measure of life experience, some knowledge of their fellow men, and, most essential of all, a modicum of personal objectivity that will permit them to apply to themselves, without too much emotional bias, the material being taught. Of such backgrounds children, most adolescents, and not a few chronologic adults possess all too little to make feasible the giving of mental hygiene instruction directly in its raw state.—*Mental Hygiene Bulletin,* Oct., 1929.

What O'Clock Is It in Industrial Hygiene?*

FRANK L. RECTOR, M. D., FELLOW A. P. H. A.

Executive Secretary, Chicago Medical Society, Chicago, Ill.

THE title of this paper suggests that it should at least be timely, but to interpret the present and future of industrial hygiene it will be necessary to sketch in briefly some of the high lights of the background of this important branch of medical and public health work.

Industrial hygiene differs from personal and community hygiene, or sanitation, in that it is a combination of both applied over a limited area, and involves a variety of problems, the majority of which are concerned with the environment of the worker, the processes on which he is engaged, and the materials with which he works.

Industrial hygiene is not a new medical entity. Its problems have been recognized and written about for more than 200 years. Some of the observations made in the earliest years of its history by Ramazzini and others hold true at the present time. The effects of unfavorable working conditions on the human body have always been the same and will continue until they are brought under control by engineering or other protective measures.

The greatest stimulus of modern times to further investigations in the field of industrial hygiene has been the enactment of workmen's compensation laws in the various states. The passage of these laws for the first time gave a definite economic urge to the study of industrial conditions and environment. When the employer could save money by studying the operations of his business from the standpoint of hygiene and health, he was not long in undertaking it.

The first approach to this problem was through strictly medical work. Provision was made to care for the sick and injured in such a way as to hasten their recovery and return to work. Later, the place where the employee labored and the materials with which he worked were studied to see what influence, if any, these factors had upon his physical condition. Laboratory and experimental studies of raw ma-

* Address of the Chairman of the Industrial Hygiene Section of the American Public Health Association, delivered at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

terials and methods of processing were undertaken to see what part they might play in the worker's health. It is through investigations of this type that industrial hygiene has made its contribution to medical and industrial science.

I like to think of industrial hygiene not as a separate scientific entity or field of work, but rather as a part of the greater problem of industrial medicine. The hygienic aspects are surely medical in concept and in application; the industrial part is engineering, chemical and mechanical. Medical knowledge is essential to a successful prosecution of studies in this field. When the medically trained mind has unravelled the knot, it requires the application of engineering skill to complete the elimination of the hazard either in construction or the process. In no other field of medicine is there such a close relation to the engineering profession. Either profession alone is unable to find the answer, and where there has not been close coöperation between the physician and the engineer the problem has remained unsolved.

I remember being called in to check over some recommendations made by a medical man relative to a dust hazard in a certain plant. The recommendation had been made—with a tone of finality that usually accompanies a lack of profound knowledge—that the installation of exhaust fans would remove the fine dust that was causing the complaint. Should the finely divided clay be removed, however, one essential ingredient of the product of this factory would be lost. The solution to this problem was not the removal of the dust by exhaustion, an easily accomplished undertaking, but rather making dust tight the process in which it was used. Here was a medical mind trying to function in one branch of the engineering field with results of no value to the practical solution of the problem in hand. Results as hopeless are produced with a similar application of engineering knowledge in the field of medicine.

Today, more than ever before, there must be close coöperation between engineering skill and medical knowledge in the solution of industrial hygiene problems. Industrial medicine is getting further and further away from the curative, and nearer and nearer to the preventive aspects of the relation of the worker to his work. Increased efforts are being made to see that men are placed at work for which they are best fitted, and fitness is being determined more carefully each year. Medical knowledge regarding materials worked with and processes employed is constantly accumulating so that in time there will be little excuse for exposing workers to unfavorable conditions.

In the vast majority of cases employers are anxious to provide the

best possible conditions for their workers. Like the average human being, they are inclined to conservatism, especially after being induced by loud talking but short performing idealists to undertake an impractical step designed to bring about the millennium in all branches of industrial relations. It is good business to keep workers well and steadily employed. It is poor business to maintain conditions that militate against steady employment. Therefore, there is every inducement for the employer to provide suitable working conditions for those in his employ. In few cases is the employer capable of determining for himself what are the best hygienic conditions to maintain in his factory or workshop. Means are usually at hand or are easily available whereby he can know his hygienic rating. His plant physician can determine for him where his greatest hazards exist, and his engineering department can provide the necessary corrections if they lie in his physical equipment. The correction of the human equipment is the function of the physician.

In the minds of some investigators, the responsibility for all evils of industrial hygiene, as well as their correction, rests with industrial management. This is but a part of the story. The worker has definite responsibilities in these matters often as great or greater than has management. Only moral suasion and threat of discharge can be brought to bear on those who fail to take advantage of sanitary facilities provided for their care.

A fact bearing largely on the worker's fitness and often lost sight of is that he is in the industrial environment but 8 hours daily, the other 16 being at his own disposal unsupervised and uncontrolled as far as his industrial relationships are concerned. The manner in which he spends his extra-industrial time must have considerable influence on his ability to carry on his regular daily work. The domestic environment, recreation habits, and dietary customs of the worker, all affect seriously his industrial capacity and efficiency. "Blue Mondays" are still common in the experience of many employers.

Turning to the entire industrial health field rather than the more restricted area of industrial hygiene, we find many interesting problems awaiting solution. One of the most important is the absorption of the sub-standard worker into the industrial scheme where he will become and remain a productive and contented member of society. By sub-standard is meant the individual subnormal from the standpoint of health as well as the person suffering from personal handicaps. It seems to me that this group is worthy of special consideration, for if its members cannot obtain employment to maintain an

independent existence they must become public charges. For this reason every effort should be made to place such workers where they will not be a danger to themselves, to others, or to property. They should be subjected to a careful examination before employment, not for purposes of rejection but to find out what they can do without injury to themselves or their employers.

When such examinations are made primarily for the purpose of exclusion, without taking into consideration the ability of the one rejected to obtain employment elsewhere, it becomes the prostitution of industrial medical procedures to the financial gain of the employer. Conscientious physicians will not lend their abilities to such undertakings. Many times physical defect is no bar to industrial employment, and when a potential worker is rejected because of some suspicious signs shown by the X-ray in the chest, for example, with no other indications of tuberculosis, or when because of some defect of limb, sight, or hearing, he is denied employment, medical knowledge is used for purposes for which it was never intended. Many handicapped persons are not sufficiently incapacitated to prevent them from rendering useful and efficient service when properly assigned.

If these people are denied employment, to what source can they turn for assistance? Is it any wonder that soap boxes are at a premium in certain quarters for impromptu platforms from which strange and sinister doctrines are preached to the passer-by? How much better would it be if industry made every effort to absorb the useable members of this unfortunate group.

It is true that refusal of employment is often predicated on the penalty imposed by workmen's compensation laws in which the last employer is held liable for the disability resulting from further impairment of function because of injury while in his employ. Many industries would gladly make places for defective workers did not the compensation laws penalize them for so doing. In several states these laws have been amended to take from the employer the extreme penalty for permanent total disability to an already defective worker. In such states there is no barrier to the employment of such persons and many industries are now giving work to those unfortunates formerly denied employment for legal reasons.

It has been the experience of observing physicians in industry that once the sub-standard worker is fitted and adjusted to his work he becomes less a risk than the so-called "normal" individual. The explanation is that the defective worker knows his limitations and will not overstep them, while the normal worker will expose himself to dissipations and excesses of various sorts, and in times of emergency

will subject himself to strains beyond his powers to withstand. It has also been the experience of many physicians in industry that persons who have suffered a disabling sickness, such as tuberculosis, and later returned to work, are usually more careful of their physical welfare than those who have not undergone such experiences.

From these illustrations it is believed that the employment of substandard workers does not carry with it the risks usually thought inherent in such cases, and when we consider further that the employment of this group in some capacity is essential to its existence, it seems only logical that a place be found in industry for its members rather than that their care be forced upon the community.

In the past those employed in factories and workshops have been thought to comprise the large proportion of industrial workers, particularly as far as the health conditions surrounding employment are concerned. In fact, this group, consisting of approximately 12 million workers, is but a small portion of the gainfully employed who comprise more than 42 million people, according to the latest federal census. Other groups are subjected to the hazards of the industrial worker, especially those involving an hygienic or environmental factor. Trade and clerical workers have many problems in common with industrial workers and it would seem that one of the next most logical steps in expanding this work would be a study of the needs of these groups.

Much remains to be known about the chemistry of industrial processes and raw and finished products. New materials and substitution products are constantly being introduced. Their physiological action in many cases is still unknown and deserves careful study and research to determine their possible dangers.

The importance of industrial hygiene is being recognized by an increasing number of scientific organizations as well as by legislative and administrative bodies. Among the more important scientific bodies taking official notice of the industrial medical field may be mentioned the following: American Association of Industrial Physicians and Surgeons, American Medical Association, American College of Surgeons, American Public Health Association, U. S. Public Health Service, American Chemical Society, state and local health departments, state and local organizations of industrial physicians, Conference Board of Physicians in Industry, private health agencies, and university and college research departments.

Among administrative groups are: U. S. Department of Labor, U. S. Bureau of Mines, state departments of labor, state industrial accident boards, International Association of Industrial Accident

Boards and Commissions, American Federation of Labor, American Association for Labor Legislation, Association of Government Labor Officials, American Management Association, National Safety Council, National Industrial Conference Board, trade and manufacturing associations, and life and accident insurance companies.

This incomplete list, covering as it does scientific, governmental, national, state and local groups and organizations of employees and employers, gives some indication of the widespread interest being exhibited in this branch of medical service.

Industrial medical and health service has not yet reached its peak of fulfilment, nor will it do so until all known sources of preventive medicine have been brought into play. We have still far to go in the physical examination of workers and the placing of them only on jobs they are able to carry. A better control over the community life of the worker and his recreation hours away from the workshop must be brought about. This latter responsibility is not that of industry, except in those cases where the industry provides all the available community activities. This control will come largely through the education of the worker to an appreciation of proper health values.

The employer's responsibility and contribution to this work rests largely on the provision of safe and sanitary working conditions. He can also at a minimum of expense make possible the provision of adequate diagnostic facilities for all but the most unusual types of illness and disability, and by this means provide an aid to the private practitioner for the better and more intelligent handling of his cases.

The health officer and the professional health worker enter this field by coöperative efforts in solving and controlling community health problems. Improvement of community sanitation and food supplies, the control of communicable diseases, the education of the worker and his family in matters of health and social welfare, are a few of the more important points of contact between the health officer and the industrial worker and management.

Space does not permit of further elaboration of these subjects. Questions of costs and organization cannot be discussed, except to say that the majority of physicians doing industrial work are not accorded the place in the organization scheme of the companies they serve that their abilities and responsibilities deserve; neither are they receiving a financial return in any way commensurate with their responsibilities. As a result, industry is getting just what it is willing to pay for, no more and no less.

While many problems in industrial hygiene have been solved, many more await solution. As industrial processes change, new factors

influencing the health of workers will be introduced. Secretary of Labor Davis said in his Labor Day speech that the working man would continue to work fewer hours, with more added to his leisure time. After having completed a survey of all federal and state prisons and adult reformatories, I am of the opinion that in many cases there is already too much leisure for certain classes. This changing condition has brought about problems of health and social welfare, and others will arise as the mechanization of industry continues, until all need for workers will have been overcome, and industry and other measures for human existence will be controlled by robots. There will then be nothing to do!

If I mistake not, industrial development has left its mark on our physical, mental and social makeup. Human beings as biological entities change very slowly. Hundreds and thousands of years are required for alterations of mind and body to become evident. With industry the whole scheme of activity changes literally over night. Greater changes have come about in the industrial world in the last fifty years than in the previous historical era. Not so with mankind. His biological changes during that time have been few. He is the same biological being today that he was five thousand years ago, and aside from being confused by attempts to make an adjustment to present conditions there has been no possible change in him during the last fifty years. Today he finds it an extremely difficult matter to adjust himself to the changed conditions created by the industrial environment in which he lives. His efforts to keep up with himself in the fields of labor, amusement, transportation and social customs, place a terrific strain on his mental and physical capacities.

Is it any wonder that so many succumb to the strain and fill our prisons and hospitals for the mentally diseased. Without wishing to be pessimistic, I can see only an increase in the population of these institutions until such a time as sobering influences are exerted over vast numbers of people now enjoying the freedom—so-called—which their new environment permits.

The threat of leisure is no idle one to our advancing civilization. Rightly used it can be the greatest force in the world today; wrongly used it becomes the greatest menace to our social and political institutions. Education offers the best solution to this problem, but it is a slow process. The education of the worker in matters pertaining to his physical health and social welfare offers the best hope of a satisfactory solution of the industrial hygiene problem. It will be slow work but if well done will not have to be repeated. Workers must be taught how to live as well as how to make a living.

Tabulation of Maternal Deaths, and of Causes of Stillbirths and Deaths of Very Young Infants*

HENRY BIXBY HEMENWAY, M. D., FELLOW A. P. H. A.

Medical Assistant Registrar, State Department of Public Health, Springfield, Ill.

THE underlying object for compiling vital statistics should be as an aid in the protection and permanency of the community. It is important that the data shall show or indicate the essential factors in the clearest manner. The tabulations are not intended for the purpose of satisfying an idle curiosity, and the state is justified in spending time and money in these compilations in exact proportion to the usefulness of the facts set forth.

It may be questioned whether methods now in vogue are always defensible. Is not a change demanded in some of those methods?

PUERPERAL DEATHS

Take for example the matter of tabulating maternal deaths. At present it is customary to compute the rate according to the number of living births recorded. In states which do not have a stillbirth form of certificate such cases are reported both as births and deaths. To tabulate according to live births it is necessary to separate the live births from stillbirths by inspecting the death certificates. This involves extra labor, and it is suspected that sometimes the published rates in such jurisdictions are made according to total births recorded.

In Pennsylvania it is required that stillbirths be reported both as births and as deaths, and we are informed that (*Vital Statistics Bulletin,* Aug., 1929) "they are classified, statistically at least, both as births and deaths"; yet in 15 per cent of the cases no birth certificate has been filed.

The real question is the risk of maternity, and the present method does not give the answer with the accuracy possible for two reasons:

First, there is a confusion of data. Although the divisor represents the number of living births, the dividend includes a large proportion of cases in which there was no living birth.

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* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

TABLE I

MATERNAL DEATH RATES (CLASS VIII)

		1926	1927	1928
Birth Registration Area of Continental United States	Births	1,856,068	2,137,836	
	Stillbirths (Varying minimum period)	70,716	82,931	
	Total Births & Stillbirths	1,926,784	2,220,767	
	Maternal Deaths (Class VIII)	12,168	13,837	
	Rates: Per 1,000 Births	6.55	6.47	
	Per 1,000 Births & Stillbirths	6.31	6.23	
Canada	Births	232,750	234,188	236,194
	Stillbirths (Period not stated)	4,064	7,336	7,588
	Total Births & Stillbirths	236,814	241,524	243,782
	Maternal Deaths (Class VIII)	1,317	1,300	1,325
	Rates: Per 1,000 Births	5.65	5.55	5.60
	Per 1,000 Births & Stillbirths	5.56	5.38	5.43
Illinois	Births	137,886*	133,662	129,668
	Stillbirths (After 4 mos. gestation)	4,897	4,701	4,678
	Total Births & Stillbirths	142,785*	138,363	134,346
	Maternal Deaths (Class VIII)	498	717	694
	Rates: Per 1,000 Births	3.61	5.36	5.35
	Per 1,000 Births & Stillbirths	3.48	5.18	5.18
New Jersey	Births	72,402	72,814	
	Stillbirths (All periods)	2,953	3,012	
	Total Births & Stillbirths	75,355	75,826	
	Maternal Deaths (Class VIII)	417	456	
	Rates: Per 1,000 Births	5.75	6.26	
	Per 1,000 Births & Stillbirths	5.53	6.01	
Washington	Births	23,989	23,315	
	Stillbirths (After 7 months)	719	650	
	Total Births & Stillbirths	24,708	23,965	
	Maternal Deaths (Class VIII)	180	155	
	Rates: Per 1,000 Births	7.50	6.64	
	Per 1,000 Births & Stillbirths	7.28	6.46	

* Including delayed reports to Aug. 1, 1928.

Puerperal deaths are those tabulated under International Code Class VIII, numbers 143 to 150 inclusive. Practically no death included under cause No. 143—"Accidents of Pregnancy," is connected with a living birth, and a large proportion do not represent any birth. Deaths from puerperal eclampsia frequently result before any birth occurs, and when children are born, many of them are born dead. Deaths from puerperal septicemia frequently do not represent cases of living birth, and a goodly proportion of other deaths in Class VIII are associated with stillbirths.

In a recent field study of maternal deaths in Michigan it was found that, of 819 maternal deaths studied, in 318 cases only were there live births. In 163 there were stillbirths, while in 336 pregnancies there was no issue.

Second, the present divisor is not the best obtainable. In the early days of vital statistics, when stillbirths were seldom recorded, the present method was excusable. Today in the United States and Canada stillbirth reports are legally required. The best obtainable divisor would now seem to be the total number of births recorded, both living and dead.

Table I gives the number of births, stillbirths, maternal deaths, and maternal death rates for 1926 and 1927, in the birth registration area of the United States, with the same data for the states of New Jersey and Washington, from the reports of the U. S. Bureau of the Census*; also similar data for Canada and the state of Illinois for 1926, 1927 and 1928.

Unfortunately there is a great diversity in stillbirth registration. In New Jersey all stillbirths of every period of gestation are reportable, but in the state of Washington a stillbirth report is not required for a stillborn child that has not passed the 7th month of uterogestation.

If, therefore, the maternal death rate is computed according to the number of births plus stillbirths reported, that rate would be abnormally high for a state which records only stillbirths during the 8th and 9th months of pregnancy. Other things being equal, the maternal death rate would be low for a state like New Jersey.

It follows that with every table relating to stillbirths there should be some indication as to the minimum period of gestation.

Physicians are sometimes slow in making records of births. The data for Illinois for 1926 include belated birth reports. The effect upon the maternal death rate as compared with the following years is striking.

If the present divisor of number of live births only is to be retained, justice demands that all deaths not associated with live births be eliminated from the dividend. This would introduce a new element of uncertainty, as in case of plural births, one dead and one live; the maternal death might perhaps properly be chargeable to the stillbirth, though it was associated with a live birth.

The true estimate of the risks of maternity must be found in using as the divisor the total number of pregnancies. This is not generally

* I wish to acknowledge the kindness of Dr. T. F. Murphy of the U. S. Bureau of the Census in furnishing advance data for 1927.

possible. A good divisor would be the number of confinements. Using data given in the "Preliminary Report" for the Dominion of Canada for February, 1929, the maternal death rates are as follows:

Per 1,000 Live Births	5.78
Per 1,000 Confinements	5.65
Per 1,000 Live and Dead Births	5.58

Unfortunately the number of confinements is not easily obtainable in published reports. It involves clerical work which many offices are not able to give on account of limited office forces. The next choice would be to use the total of live births and stillbirths, plus all deaths recorded for Class VIII in which no birth has been recorded. This seems hardly practicable. Practically, today the best divisor for this purpose is therefore the total number of living births, plus all stillbirths.

INFANT DEATHS

In the *Pennsylvania Vital Statistics Bulletin* for June, 1929, it is said, speaking of "old age":

> The acts of man are traditionally in seven ages, but it is the privilege of the statistician to reduce the number to five, as in the series of articles of which this is the last. In each age, mortality as well as personality presents characteristic features. In infancy the chief causes of death are premature birth, congenital debility and malformations, and certain acute infections which are more dangerous to the very young than to older persons.

In point of fact there seems to be a great deal more difference in the causation of deaths of infants under 1 week of age, as compared with those of 1 month to 1 year of age, than there is between the latter class and children of school age. Infant deaths should therefore be divided into two classes, making a total of six ages instead of five, as referred to above.

In the study of the deaths of very young infants, is the present statistical usage satisfactory—particularly considering the deaths of infants under 1 week of age? It is customary to tabulate according to prematurity, difficulty of birth, defective development, and conditions associated closely with the change from the existence of fetus to that of child. But, do these records really show the true causation of the deaths? Why is a child prematurely born? Why is there a defect of development?

It will be noticed that very frequently the death certificate of the new-born infant gives a record of maternal uremia, of maternal tuberculosis, or maternal syphilis, or other diseased condition of the mother. The true cause of death is the condition which produces the

premature birth, the difficulty of birth, or the defect of development. The same is true relative to stillbirths. There is no present code which enables the statistician to tabulate these early deaths and stillbirths according to the underlying causation.

STILLBIRTHS

It is a custom in tabulating stillbirth statistics to separate urban and rural districts for comparison; to show the number of stillbirths according to months of occurrence; according to legitimacy; according to the age of the mother; according to the nativity of the mother; in comparison with the number of live births; and also according to cause of stillbirth. Most of these tabulations are as yet of little practical utility because they are not correlated with the underlying causes. The Canadian tabulation does not give the information as to cause of stillbirth.

It will be noted that the causation of stillbirths and deaths of very young infants may be divided into three general classes:

1. Maternal diseased condition
2. Conditions either of maternal formation, or maladjustment of the child causing difficulty of birth
3. Diseased condition of the child apparently not dependent upon the maternal disease

For the purposes of study, in order to prevent stillbirths and deaths of very young infants, it seems therefore advisable that the U. S. Bureau of the Census be asked to devise a special code or scheme for tabulating these deaths according to real causation.

What is here suggested is not that deaths of infants during the first week after birth be omitted from, or classified differently in, the general mortality tables, nor the infant mortality tables; but that a special tabulation be made to include these deaths with stillbirths.

Apparently, the approved form of stillbirth certificate should be changed in order to bring out the necessary facts. It should show distinctly what, if any, diseased condition of the mother was present immediately before the birth of the child; and what, if any, operative measures were used. It should show whether or not during pregnancy the mother had had any illness or injury. If difficulty of birth existed, the certificate should show clearly the nature of that difficulty. The certificate should also show if the child had probably died before labor began, or died during birth. These questions might be printed on the back of the certificate, giving ample space for full information. Similar questions might be added to the back of the certificate of death, with instructions that they be answered when the certificate is for an infant less than 1 week old.

Milk-Borne Septic Sore Throat and Scarlet Fever*

CLARENCE L. SCAMMAN, M. D., FELLOW A. P. H. A.

Deputy State Commissioner of Health, Boston, Mass.

THE first milk-borne outbreaks of scarlet fever reported in this country occurred in New York and Vermont in 1893.[1] Through 1928, eighty-seven milk-borne outbreaks of scarlet fever, and forty-five of septic sore throat have been recorded in the United States.[1-4] No doubt other unrecorded outbreaks have occurred.

The eighty-seven outbreaks of scarlet fever caused 8,368 cases with 39 deaths (data incomplete). The forty-five outbreaks of septic sore throat caused 22,431 cases with 187 deaths (data incomplete). These figures give fatality rates of 0.5 for scarlet fever and 0.8 for septic sore throat. The geographic distribution of these reported outbreaks is given in Table I.

TABLE I

GEOGRAPHIC DISTRIBUTION OF OUTBREAKS

State	Scarlet Fever	Septic Sore Throat
Massachusetts	25	21
New York	20	7
New Jersey	9	—
Connecticut	5	4
Michigan	5	—
Illinois	4	4
Ohio	4	1
Wisconsin	3	2
Montana	3	—
Vermont	2	2
Pennsylvania	2	1
District of Columbia	2	—
Minnesota	2	—
Rhode Island	1	—
Maryland	—	1
New Hampshire	—	1
Oregon	—	1
Total	87	45

Of the sixty-six outbreaks of scarlet fever in which the month of onset was known, 70 per cent, or about three-fourths, occurred from

* Read at a Joint Session of the Health Officers and Epidemiology Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

December to May, inclusive. Seventy-three per cent of the septic sore throat outbreaks for which this information is known occurred during the same interval (see Table II).

TABLE II

MONTH OF ONSET

Month	Scarlet Fever	Septic Sore Throat
January	9	4
February	7	8
March	2	2
April	11	8
May	10	6
June	2	3
July	6	5
August	4	2
September	2	2
October	3	1
November	3	—
December	7	1
Unknown	21	3
Total	87	45

Table III shows the probable source of infection in those epidemics in which this fact was stated. Of the fifty-six scarlet fever outbreaks, 82 per cent were said to be due to a milk handler, and 2 per cent to a diseased cow and a milk handler. Of the thirty-three septic sore throat outbreaks, 55 per cent were said to be due to a milk handler, and 30 per cent to a diseased cow and a milk handler.

TABLE III

POSSIBLE SOURCE OF INFECTION

	Scarlet Fever		Septic Sore Throat	
Possible source of infection	No. of Epidemics	Per cent	No. of Epidemics	Per cent
Diseased cow	1	2	5	15
Milk handler	46	82	18	55
Diseased cow and milk handler	1	2	10	30
Others (milking utensils, etc.)	8	14	—	—
Total	56	100	33	100
Source of infection unknown	31		12	

Table IV shows certain facts having to do with two outbreaks of septic sore throat and one of scarlet fever, all of which occurred in Massachusetts during the last two years. Note how alike the two epidemics of septic sore throat were in the average number of cases per family, the attack rate, the number of cases per 100 quarts of milk sold daily, and the percentage of cases age 15 or over. In over 1,500 cases of endemic septic sore throat reported in Massachusetts from 1918 through 1928, 59 per cent were age 15 or over, a difference

TABLE IV

FACTS CONCERNING OUTBREAKS

	Septic Sore Throat		Scarlet Fever
	Lee	Charlton	Plymouth
No. of cases on one milk route	565	84	101
No. of deaths on one milk route	38	2	Unknown
No. of families on milk route	244	44 *	250 †
Total "customer" population	1,249	195	Unknown
Source of infection	Cow	Man	Man & (Cow)
Average cases per family	2.3	1.9	0.4
Attack rate	45	43	9.6 ‡
Cases per 100 quarts of milk sold daily	81	84	40
Percentage of cases age 15 and over	78	79	43

* Total of 49 families involved but information on 44 only
† 115 visited
‡ 36 cases among 374 people in 115 families visited

of 19 per cent from the figures given in Table IV, which is statistically significant.

Godfrey in his study "Age Distribution in Milk-Borne Outbreaks of Scarlet Fever and Diphtheria,"[5] reported an unusual proportion of adult cases in milk-borne outbreaks of these diseases. This type of age distribution apparently holds for outbreaks of septic sore throat. In the Plymouth outbreak of scarlet fever there was an unusual proportion of adult cases, 43 per cent age 15 or over, compared with 16 per cent of all cases of scarlet fever reported in Massachusetts from 1923 through 1927.

Dr. Knowlton[6] of Connecticut reported a milk-borne outbreak of scarlet fever in Bristol in which "92 cases occurred among users of milk from one supply amounting to 270 quarts per day." This gives a rate of 34 cases per 100 quarts of milk sold daily, which is practically the same found in the Plymouth outbreak. The number of cases per 100 quarts of milk sold daily is a very rough figure, but it is worth noticing that the rates were about the same in the two outbreaks of each disease, and were different for septic sore throat and scarlet fever.

DISCUSSION

The Lee outbreak was without question septic sore throat. The *Streptococcus epidemicus* was isolated repeatedly from the udder of the infected cow and the same organism, identical in its cultural characteristics, from the throats of several patients and the blood of one. The clinical,[7] epidemiological,[8] and bacteriological[9] studies already published portray a perfect picture, marred only by lack of proof that a human being infected the cow.

While the Charlton[10] outbreak was clinically septic sore throat, the disease was much milder than in Lee, with few complications.

There were 2 deaths. Physical examination of the 8 cows in the herd showed, according to the veterinarian, a healed mastitis in the right rear quarter of 1 cow. Three bacteriological examinations of milk from this quarter failed to reveal infection. Four separate bacteriological examinations of the milk from each of the other cows by two different laboratories likewise were negative. The first cases—6—were reported to us on June 25. Investigation showed that 84 cases had occurred with onsets as shown in Table V.

TABLE V

SEPTIC SORE THROAT, CHARLTON—DATE OF ONSET OF CASES

Date	Number	Date	Number
June 14	2	June 21	8
15	3	22	6
16	6	23	9
17	12	24	4
18	8	25	2
19	5	Unknown	1
20	18		
	Total		84

Eighty-three of these had their onsets in a period of 12 days between June 14 and June 25. In 1 case the actual date of onset was unknown. Infection of the milk probably occurred at least 48 hours prior to June 14, and at intervals during the following 10 days.

The source of the infection was the dairyman and his family. Late in February or early in March the daughter, age 17, had an unreported case of scarlet fever. On March 30 the son, 15, had his onset, was hospitalized on April 3, and discharged and sent home as a "clean" case with throat cultures negative for hemolytic streptococci May 22. Soon after the son's return to the farm the father developed a sore throat, and his wife said he had a generalized rash. He was not seen by a physician at this time. The father alone cared for the cows, which were milked by machine but "stripped" by hand. All the milking utensils were washed in the household and not steamed. The milk was bottled and capped by hand.

The father continued to work during his illness and until Sunday, June 16. He attended to the production, handling and distribution of the milk on this morning, but went to bed in the afternoon with a sore throat which had been troubling him for some 10 days or more. He was hospitalized June 21 and died June 24 of a general streptococcic septicemia.

From June 16 to June 21 this man was cared for at home by his wife and daughter, one or both of whom washed the milking utensils, which were not steamed. In addition, the mother developed a septic

finger which was opened on June 18. On June 19, the customers were advised by the dairyman to boil their milk, but the milk was not shut off until June 21. Cultures from the blood of the dairyman and from the throats of three patients were hemolytic streptococci of the beta type, but did not have the special characteristics of epidemicus. The strain did produce a Dick toxin about one-tenth as potent as the Hygienic Laboratory standard.

The Plymouth[21] outbreak was first called to our attention on March 7, when the department was asked to investigate the possibility of a milk-borne outbreak of scarlet fever.

Investigation showed that 101 cases of scarlet fever occurred on the milk route of dealer W, and 26 on the milk routes of thirteen other dealers in the community. Of these 26 cases, 22 were shown to be due to contact, and in 4 the source of infection was undetermined.

During January and February, Plymouth reported 7 and 13 cases of scarlet fever, respectively. The January and February incidence in 1929 was about twice the average incidence for the same months for the last 5 years.

Table VI shows the dates of onset of the 127 cases occurring between March 3 and March 31 on the route of dealer W, and thirteen other dealers.

Ninety-five of the 101 cases occurring on the milk route of dealer

TABLE VI

PLYMOUTH OUTBREAK

Date of Onset of Cases with Milk Dealer

Date of Onset	Dealer W	Thirteen Other Dealers	Total
March 3	2	—	2
4	7	1	8
5	14	3	17
6	26	4	30
7	13	2	15
8	11	3	14
9	11	—	11
10	6	1	7
11	5	4	9
12	1	—	1
13	1	—	1
15	1	1	2
16	—	1	1
17	1	1	2
20	1	—	1
22	—	3	3
26	1	—	1
27	—	1	1
31	—	1	1
Total	101	26	127

W came down within a period of 9 days, between March 3 and March 11. The milk was stopped on the morning of March 7, so that infected milk may have been delivered up to that date. The 6 cases occurring from March 12 on were presumably secondary. At least 5 more of the 95 cases under consideration could have been secondary on the epidemiological evidence. The peak of the epidemic occurred on the 4th day. Forty-five per cent of the cases occurred during the first 4 days of the outbreak.

Dealer W delivered about 250 quarts of raw milk a day, of which about 80 were from his own farm, and about 170 purchased from producer B. Investigation of the farm of producer B showed no infection among the milk handlers. Physical examination of the fifteen cows of producer B by veterinarians showed no evidence of garget, nor did bacteriological examination of the milk from these animals show infection. Physical examination by veterinarians of the seven cows of dealer W showed three with garget, one of which was not being milked. Cultures from the milk of the two cows with garget, which were being milked, showed beta hemolytic streptococci of the human type. One of the milk handlers of this dealer had a suspicious looking throat, a culture from which showed hemolytic streptococci of the beta type. This milk handler had a history of having had grippe some 6 weeks before. No history of scarlet fever could be obtained from him or his family. Careful examination of this family group failed to show any desquamation.

Thus, the only evidence that a human being might have infected the two cows in the herd of dealer W is that one of the milk handlers with an illness some 6 weeks before, which was diagnosed as "grippe," had a suspicious looking throat with a culture positive for hemolytic streptococci of the same type as those isolated from the udders of the two cows. When and how the infection of the cows took place is problematical.

Cultures from the milk handler, the milk of the two infected cows, and from cases of scarlet fever were sent to two different laboratories. One laboratory reported only on the cultures from the two cows. One strain showed the characteristics, cultural and immunological, of the epidemicus type, while the cultures from the other cow showed the characteristics of the scarlet fever strain. The second laboratory reported the isolation of the epidemicus type from the two cows and from nine individuals. Eight strains from individuals differed from the epidemicus type in that they showed no capsule; produced small zones of hemolysis; and showed a slight tendency to cloud the broth. In three instances both types were found in the same individual. It

was suggested that these two types of streptococci represent the smooth and rough types of the same hemolytic streptococcus.

It is our opinion that the present weight of evidence shows that milk-borne outbreaks of septic sore throat and of scarlet fever are generally the result of an infection of one or more cows by an individual carrying hemolytic streptococci of the human type. As a result of this the milk is already infected when it leaves the cow and the outbreak is due to this infection rather than to contamination of milk in the interval between its leaving the cow and its use by the consumer. With these ideas in mind, our recent investigations of these milk-borne outbreaks have been carried out with the aim of finding an infected cow or cows and also of locating the human source of the cow's infection. It is not always possible to locate both the human and the bovine source of infection, and it is almost too much to expect that both of these should be found in every epidemic. Both the person and the cow may show positive cultures for only a brief period, which may well have passed before an investigation is undertaken.

SUMMARY

Eighty-seven milk-borne outbreaks of scarlet fever have been recorded in the United States from 1893 to 1928, and 45 milk-borne outbreaks of septic sore throat 1908–1928.

Fifty-five per cent of all the milk-borne outbreaks of scarlet fever and septic sore throat recorded were in Massachusetts and New York.

About three-quarters of the recorded outbreaks of both diseases had their onsets between December and May.

In 82 per cent of the outbreaks of scarlet fever a milk handler was the probable source of infection, as compared to 55 per cent of the outbreaks of septic sore throat.

In certain milk-borne outbreaks of both scarlet fever and septic sore throat in Massachusetts there was an unusual proportion of cases age 15 and over.

In the Lee outbreak of septic sore throat a cow was found to be infected with a *Streptococcus epidemicus*.

In the Charlton outbreak (clinically septic sore throat) the source of infection was the dairyman or his family, all of whom had scarlet fever except the mother, who had a septic finger. No infected cow was found.

In the Plymouth outbreak of scarlet fever the probable source of infection was a milk handler. Two cows were found to be infected.

The bacteriological evidence showed conclusively that the Lee outbreak was caused by a streptococcus of the epidemicus type. Studies of organisms from the throats of patients in the Charlton outbreak showed them to be definitely not of the epidemicus strain, but closely related to the scarlatiniform strain.

Cultures from the Plymouth outbreak of scarlet fever, on the other hand, were reported of both the epidemicus and scarlatiniform types.

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DISCUSSION

MILLARD KNOWLTON, M. D., FELLOW A. P. H. A.

Director, Bureau of Preventable Diseases, State Health Department, Hartford, Conn.

IN his excellent paper Dr. Scamman has listed 132 milk-borne outbreaks of scarlet fever and septic sore throat that have been reported in this country during the past 35 years. These outbreaks were reported from northern states. None came from further south than Maryland and the District of Columbia. Those states in the South, which, according to a recent editorial in the JOURNAL, have assumed leadership in public health, have not contributed a single outbreak to the list. Does this represent a difference in the alertness of health officials, a difference in susceptibility to the streptococcus, or a difference in milk consumption in the two sections of the country?

That three-fourths of these outbreaks should occur from December to May is not surprising. Scarlet fever is more prevalent at this time. A similar seasonal variation may be expected in the case of other streptococcus infections.

Dr. Scamman's figures show that septic sore throat has an attack rate over four times that of scarlet fever; that it attacks nearly two and one-half times the number of persons per 100 quarts of milk distributed; and that nearly double the per cent of cases are over 15 years of age. Why? Scarlet fever is more readily spread by contact. More people are immune to scarlet fever, especially in the higher age groups. Fewer susceptibles—fewer cases! Do you agree? Or, does septic sore throat fail to confer immunity?

The Charlton outbreak of septic sore throat followed the occurrence of scarlet fever in the dairyman's family. On the assumption that any well behaved streptococcus will breed true to type, I suppose we may be justified in the view that scarlet fever had nothing to do with septic sore throat. Yet, how do we know that *Streptococcus epidemicus* is not a mutation form of *Streptococcus scarlatina?* This question appears pertinent also in connection with the Plymouth outbreak of scarlet fever where two types of streptococcus were isolated. Are *Streptococcus epidemicus* and *Streptococcus scarlatina* mutation forms of the same parent stock? Are these two microbes really, as one laboratory suggests, the smooth and rough types of the same organism? With *Streptococcus epidemicus* present in the outbreak, why did only scarlet fever cases occur?

Perhaps those of us who know nothing about the intricacies of laboratory procedure in dealing with the elusive streptococcus may be pardoned for asking ques-

tions. The practical application of epidemiology to the prevention of disease requires the translation of laboratory reports into administrative procedure. Some of us who must face these problems in our daily work would like very much to know just what is meant by *Streptococcus epidemicus*. We would be immensely pleased if the laboratory worker could inform us definitely and infallibly which streptococci are pathogenic for humans and which are not. Unfortunately, we are not quite sure about the matter at the present time. We are optimistic, however, and hope that some day we may know something about the streptococcus.

Because of its relation to procedure for disease prevention, perhaps the most important point emphasized by Dr. Scamman is that types of streptococcus pathogenic for man may also be pathogenic for the cow. Jones found in 1927 that cows may become infected with the scarlet fever streptococcus. This was confirmed by our experience in Connecticut with two milk-borne outbreaks of scarlet fever in January and May, 1928. In each case a cow was found to be infected with a streptococcus which responded to tests for the scarlet fever streptococcus. In each instance strains of streptococcus obtained from the throat of a man working on the farm, from the milk of the infected cow, and from the throats of scarlet fever patients appeared to be identical. One laboratory reported *Streptococcus epidemicus;* others reported what appeared to be *Streptococcus scarlatina*. Further confirmation of the point that the scarlet fever streptococcus may cause pathology in a cow's udder is now afforded by Dr. Scamman's report of the outbreak at Plymouth. The same point with reference to septic sore throat is illustrated by the Lee outbreak.

This is a new point, and its recognition requires a new procedure for the emergency handling of milk-borne outbreaks. As soon as epidemiological evidence justifies a suspicion that milk may be responsible for an outbreak of scarlet fever or septic sore throat, the following steps should be taken:

1. Stop the sale of suspected milk at once unless it can be pasteurized.
2. Advise boiling all suspected milk on hand at the time the milk supply comes under suspicion. Arrange to have this advice reach each customer at the earliest possible moment.
3. Before approving a pasteurization plant for pasteurizing a suspected milk supply, inspect the plant as to type of apparatus, method of operation, accuracy of thermometer used to determine temperature, and such other points as may need attention to make sure that a satisfactory heat treatment of milk handled in the plant will be obtained.
4. Examine all milk handlers by both clinical and laboratory methods, and remove from handling the milk all persons found to be diseased or to be carriers.
5. Examine all cows in the dairy herd by both clinical and laboratory methods and remove from the herd all found to be infected.

These measures should result in prompt control of milk-borne outbreaks. The best way to prevent such outbreaks is to pasteurize all milk.

Greatness

WITH new understanding we have come to realize at last what we might have known long, long ago, had history served us as it should. We have come to know that God's true princes do not always stand god-like and shining, pricked out forever from their fellows. We have come to understand great movements that sway the minds of men from our studying chance writings and sayings of mere anonymous and simple souls.—T. Wingate Todd, *Bull. Acad. Med.*, Cleveland, O.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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THE CORONER'S DILEMMA—FOOD POISONING

RECENT press reports, particularly from Chicago, have called attention to the interesting possibility of poisoning from the mechanical type of refrigerators, presumably from methyl chloride gas. Many of the cases and deaths were at first regarded as food poisoning. Too often does this diagnosis appear in health department records and coroner jury proceedings, without proper and adequate epidemiological, bacteriological and toxicological investigations by the constituted authorities. Geiger and other workers in this field generally recognize two types of food poisoning. One type is due to the contamination of the food with some one of the paratyphoid group, or other bacteria derived from a human or animal carrier, or from the meat of an animal suffering with a specific infection of these germs.

Subsequent incubation of the contaminated food through insufficient cooking, refrigeration or storage allows the bacteria to grow and form a poisonous product, or perhaps in the process of heating, certain products become soluble and evidently poisonous.

The consumption of such food is followed after several hours by nausea, abdominal pain, vomiting, prostration, diarrhea, and perhaps fever. Complete recovery within 48 hours is the rule.

In making investigations for this type of poisoning, one should: (*a*) Always suspect freshly cooked or warmed over foods. Preserved foods are rarely at fault. Foods are apparently normal as to taste, appearance, odor and texture. (*b*) Make bacteriologic examination of excreta of patients and the suspected food for the paratyphoid group and other organisms. Feed mice with suspected food both directly and by stomach tube. (*c*) Make bacteriologic and epidemio-

logic search for human carriers and possible contamination from animal sources.

The other type of food poisoning is known as botulism. It is due to the contamination of the food with a specific germ known as the *Bacillus botulinus*. This is found in the soil practically throughout the world in the spore form, and as such is not poisonous.

When so-called non-acid foods, such as many vegetables, fish and meat, preserved by faulty and unsanitary methods are eaten, botulinus poisoning may occur. The symptoms usually appear within 24 to 48 hours. There may be marked muscular weakness, disturbances of vision, loss of ability to swallow and talk, constipation, rapid pulse and subnormal temperature—rarely any pain. Death occurs from respiratory failure.

In making investigations for this type of poisoning, one should: (*a*) Always suspect preserved foods, and meat products, such as sausages. Spoilage is noted in many instances. (*b*) Test suspected food for toxin by inoculation of mice, guinea pigs or rabbits. Test for type with specific antitoxin. Culture suspected food for the presence of spores, particularly if food has been previously boiled.

X–RAYS AND THE PUBLIC HEALTH

IT is by now an accepted doctrine that the greatest progress in public health is to be made in coöperation rather than in competition with the medical profession. The modern health commissioner seeks not so much to supplement as to reinforce the public health activities of his colleagues in private practice. Why should not this be as true in the field of tuberculosis control as it is, for example, in the control of venereal disease or of diphtheria? For the early diagnosis of these diseases every assistance is given by the state or the municipality. The early diagnosis of tuberculosis is of no less public importance. It is true that public health laboratories will examine and report on sputum; but in view of our present knowledge of tuberculosis we can no longer be satisfied with that as an aid to *early* diagnosis.

As Dr. Gerald B. Webb[1] has boldly stated: "Roentgen examination is the only method available for detecting early pulmonary tuberculosis." How often is this examination made? Certainly not as a "routine roentgen examination of all young adults," which is Dr. Webb's ideal. How often, on the other hand, must the practicing physician hesitate, when he does definitely need the assistance of the X-rays, because he knows that his patient can hardly bear the not inconsiderable cost?

Will not some progressive health department install a radiologist and invite the practitioners of its constituency to send all their patients suspected of tuberculosis and all contacts of active open phthisis for X-ray and expert interpretation whenever the financial status makes it impossible for this aid to be privately obtained?

The existence of public tuberculosis clinics is no more an objection to the giving of such service than is the existence of a venereal disease clinic an objection to the giving of service by laboratory tests and examinations. Moreover the assistance of the physician who is in the front trenches in the war against disease, is of much greater value to the morale of the army than is the occasional and rather haphazard injection of shock troops into the fight.

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THE NEW ORDER IN HEALTH EDUCATION

ON another page we publish a letter showing the reaction of a worker to his experience on a Chautauqua Circuit which carried him over a large part of the United States in the interests of health. Even if we do not agree entirely with his views, they certainly give us food for thought.

There can be no question that healing and the relief of suffering appeal to the sympathetic, and the general public, more than does the prevention of disease. The average person has not yet learned the meaning of the term "positive health" and all that it carries in the way of joy of living and efficiency.

Nothing is further from our intention than to knock health officers. Their work is fine and indispensable. We believe, however, that they are deficient when it comes to the education of the public. Our present methods are very much like those of the agricultural experiment stations. One station, generally the government, publishes a bulletin on spraying potatoes, for example, and gives photographs of two piles of potatoes, one showing the yield from an acre which has been sprayed, and the other from one not sprayed. The same routine is followed in regard to fertilizers and many other things. Agricultural stations throughout the country perform the same experiment, and similar bulletins are issued, *ad nauseam*. That some good is accomplished no one can deny, but there is a woeful lack of originality, much wasted effort and an enormous waste of printer's ink and paper. One reads of the millions of bulletins which are sent out from Washington,

but no one knows the percentage of these that go into the waste-basket unread.

Do not our health officers follow the same general plan? Do they not use plate matter, and is not the getting out of the bulletin a task which they dread, and in which they take little interest, except for the statistical part, which they use to show the amount of work done?

We do not criticise this method entirely. When something new is brought forward, such as the discovery of the diphtheria antitoxin, the use of toxin-antitoxin, or the danger of undulant fever from unpasteurized milk, the more widely the information is spread, the better for everyone. In spite of this we are compelled to believe that there is a lack of originality in the educational programs of health officers, who are selected not because they are spellbinders or know how to edit a popular magazine, but on account of their knowledge of disease and preventive medicine. Knowledge must be available in order to be of use. It cannot be kept locked up in a strong box if it is to accomplish anything in the world. For this reason our JOURNAL conducts a department of Education and Publicity from which health officers can derive many useful hints in the art of putting things over. We all are in need of education, but the public needs it more than the profession.

The day of mystery, gold-headed canes, dress-suits, high hats and Latin prescriptions in medicine is gone. Distasteful as the truth may be, the medical man and health officer must learn something of the arts of the promoter in order to accomplish the greatest good.

INFANT MORTALITY IN OUR CITIES

WE have become so accustomed to a drop in the infant mortality rate from year to year that for a moment there is just a little pang of disappointment that 1928 was an exception. According to the *Statistical Report of Infant Mortality for 1928 in 729 Cities of the United States,* recently issued by the American Child Health Association, the rate for the cities of the country was 68.3. This represents a slight rise over 1927 when the rate was 64.9. The 1927 rate was the lowest ever attained and any perturbation over the setback in 1928 may be immediately assuaged in the realization that the 1928 rate, even though not quite so good, is still the second best on record.

The rate for "the country" is now coming to be much more significant than formerly. In 1915 "the country" was represented by the records from 10 states and the District of Columbia, which then constituted the Birth Registration Area. In 1928 "the country" was

represented by 44 states and the District of Columbia. The growth in the size of both the Death and the Birth Registration Areas is a matter of extreme satisfaction. One more state with acceptable records, Nevada, was added in 1929 so that now but 3 states, South Dakota, Texas and New Mexico, remain unrepresented in our national vital statistics.

The report, based on provisional figures from the U. S. Bureau of the Census and records from state and local officials, gives 1928 rates for each of 729 cities over 10,000 population in 1920, as well as rates for individual years since 1923. While the figures themselves are believed to be accurate, caution is urged in the interpretation placed on the rates for individual cities. Conscious public health effort is not alone responsible for the magnitude of a rate, but the presence or absence of hospitals and other children's institutions and, in the words of the report, "state of wealth, family customs characteristic of different race and nationality groups, knowledge and probably climate." It is these factors which explain why cities of the west coast and of certain middle western states have the lowest infant mortality rates and have had for years. Whether or not an unfavorable combination of these factors excuses a city for having a high rate is another matter. Eastern and southern cities would be inclined to think that it did.

Even making allowances for unusual local conditions, there is a direct challenge in the fact that where one-sixth of our cities have rates under 50, another sixth have rates over 90. The progress of the recent past is encouraging, but that should not dissuade us from continued efforts in baby life saving. There is every reason to believe that further reductions in the death rate are entirely possible and practicable.

LETTER TO THE EDITOR

To THE EDITOR:

In response to my curiosity while traveling in the mountainous region of Tennessee, a doctor directing a county health department said:

> If you mind your own business you'll find no better people in the world. About two weeks ago I was up in an isolated settlement. One of the mountaineers casually asked about this new medicine that kept away diphtheria. I explained. He said he wanted his children to have it. So I returned in a few days and there were forty children from near and far assembled to receive toxin-antitoxin. The word had passed around. They came.

Why? Is it that the primitive, native intelligence goes straight to the heart of a simple proposition? Is it a confidence in the truth of science unspoiled by suspicions engendered by its ignorant enemies, unspoiled by the patronizing mellifluousness of its friends?

One director of health in what is probably the most progressive of states says the people know too much. They are demanding of the doctors more than the doctors are prepared to give. He says the educational efforts of preventive medicine should be expended on the doctors. Contextually, his meaning is that the information contained in the leaflets and booklets, and which for the most part stays there, should be in the doctor's head, and by his voice conveyed to those who would learn. Passing this by, let us contemplate the avalanche of instruction in disease prevention constantly sweeping down on the populace. Booklets, bulletins, circulars, games, almanacs, press notices, boiler plates, posters, lectures, lantern slides, moving pictures, newspaper advertisements, exhibits, plays, health automobiles, health trains, etc., etc. How much good does it all do? Compare the results with the word of the doctor to the mountaineer.

The spoken word is conceded to be the most valuable means of imparting knowledge. In what way? To an assembled multitude? Possibly our impatience demands great round numbers, but we must remember there aren't many Ciceros or William Jennings Bryans in the medical profession. I have seen Herculean efforts put into so-called publicity for a grand public health rally presided over by medical supermen, rewarded by two or three rows of beautiful nurses, tubbed and starched, and a few doctors' wives and offspring. The nurses of course were detailed for fatigue duty, the graduates were "busy."

What keeps the multitude away? Dryness, no tabasco, not even salt. I, myself, have writhed in agony till I thought the speaker must feel my pain and liven things up a bit or quit. But no! He was enjoying himself.

So rarely does this method work that we might as well give it up. But if the deans and professors of medicine can't attract an audience, or even interest the well-intentioned few, to whom can we turn? To the family physician. If he has the knowledge and the faith he can speak to a man or woman, his own people, in the quiet of his office or the home and they will listen, believe, and do as he says. Then why don't the doctors do it? They have never been told it is part of their work. They have been trained, like the Victorian children, not to speak until spoken to. Public health, many of them believe, is distinct from their life work. They watch the health officer do their work as some railroads watch the auto-buses

carry their passengers. They, themselves, should do preventive medicine as progressive railroads have installed bus lines and increased their business.

The public has grown stale from constant exposure to health instruction. No matter how pretty or charmingly illustrated the educational literature, it can't compete in interest with a Sears, Roebuck catalogue. Would it be possible to declare a 10-year moratorium to the distributors of hit or miss health tracts? And, above all, to silence with a sledge hammer or a rope or poison that hackneyed phrase, " See your doctor," that recurs like the thump of a flat wheel every minute? If so, put the money into a sound, authoritative volume on the prevention of disease for doctors, and insist that they " See your families." Stir up every medical society in the country to give over a sufficient number of meetings to the compelling and insistent fact that modern medicine is passing through a transitional period, a period of reconstruction; that its most valuable function is prevention; that today treatment and cure, though necessary, are secondary and more or less emergency measures—and then have demonstrations in the practice of preventive medicine.

The ideal of medicine will not be reached until the doctor becomes primarily the teacher, weaving his teaching into his daily rounds, and not be, as at present, merely subjected about once a year to a bout of *paralysis agitans* as he wanders all over the domain of health before a luncheon club. His patients and friends will expect him to tell them what scientific medicine can do to keep them well, and expect him to administer it. The sound basis of modern dentistry is prophylaxis; it is an inspirational guidepost to general medicine. When the health clients of the doctor are watched and cared for through the successive periods of life, immunized at the proper time against contagious diseases, given physical examinations at regular periods and thus saved money, time, distress and heartaches, the doctor can look the world in the face because he is doing his full duty.

If the doctor will abandon the vain gesture of old King Canute and realize that preventive medicine offers greater victories over disease than curative medicine through all the centuries, it will be but a short time until official health authorities will be only administrators, guard the water and milk supplies, look after the sewage disposal, keep the statistical records, and act as a clearing house of information as to the trend of health and disease.

JOSEPH P. KANE, M.D.

ASSOCIATION NEWS

Executive Board Meeting

The first meeting of the new Executive Board since the Annual Meeting was held in New York on November 16 and 17. The principal business at this meeting of the Board was consideration of the organization of the activities of the Association under the terms of the new By-laws adopted at Minneapolis. The responsibilities of the four standing committees created by these By-laws were discussed at length and consideration given to personnel for appointment to these committees. These appointments when made will be announced in the JOURNAL.

A delegation of health officers from New Jersey waited on the Board to urge the continuance of *The Health Education Service,* pointing out that in their communities it had proved to be a most valuable asset in promoting the work of the health department. The Board referred the matter to the new Committee on Meetings and Publications, and, pending a review of the situation by this committee, authorized the continuation of the " Bulletin " to July, 1930.

The relation of the committees of the Association and its sections to the new plan of organization was discussed and decision on these matters deferred until the appointment of the new committees and their report to the Board.

Dates for the Fort Worth meeting were tentatively selected for the week of October 20 or the week of October 27, final decision to be made so that conflict will be avoided with annual meetings of other societies of interest to the Association members.

The next meeting of the Board will be held on December 6, together with the chairmen of the four standing committees.

HEALTH CONSERVATION CONTEST

Eighty-four cities representing 33 states, Hawaii, and the District of Columbia, are now officially entered in the Health Conservation Contest which opened June 20, 1929.

The Chamber of Commerce of the United States is conducting this contest to further development of national health interest. Other agencies interested in health work and realizing the immense value of the Health Conservation Contest, are urging active support of this nation-wide movement.

The purpose of this contest is to reduce economic losses due to unnecessary illness and death and to promote a constructive health program. The layman and the professional are working together enthusiastically with this aim in view.

The period of this year's competition ends on January 1, 1929. Awards for the winning cities will be made at the next annual meeting of the Chamber of Commerce of the United States. In order that the contest may be as fair as possible, a city will compete only with cities of its population class. A fact-finding schedule, dealing with the fundamental items of a community health program, has been sent to all con-

testants. A committee of health experts will grade the cities enrolled on the basis of this schedule.

The field staff of the Committee on Administrative Practice is in a position to give a limited amount of consultant service to those cities in the contest. This service is rendered without charge upon the invitation of the health officer. Fifteen cities have already taken advantage of this offer and have declared it extremely helpful in analyzing local problems and in formulating programs.

MERRILL E. CHAMPION RESIGNS

The Journal regrets to announce the resignation of Dr. Merrill E. Champion as editor of the Child Hygiene Section notes. Dr. Champion has been a contributor to this department since the resignation of Dr. Taliaferro Clark in March, 1926.

Dr. Champion is now handling child health demonstrations for the Children's Fund of Michigan in Detroit, and finds it impossible to continue the JOURNAL work.

NEW MEMBERS

Grace Abbott, A.M., Ph.B., Washington, D. C., Chief, U. S. Children's Bureau

M. Ciuca, M.D., Iassy, Roumania, Professor of Hygiene, University of Iassy (Assoc.)

Prescott A. Creelman, M.D., Charlottetown, P. E. I., Chief Health Officer

J. George Dempsey, M.D., New Orleans, La., Registrar, Vital Statistics, State Board of Health

Laura A. Draper, B.A., B.S., Medford, Mass., Assistant Director, Boston Community Health Association

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Glenn S. Everts, M.D., Philadelphia, Pa., Medical Secretary, Philadelphia Health Council and Tuberculosis Committee

Elton M. Hilton, B.S., Yosemite National Park, Calif., Sanitary Inspector, National Park Service

Elisabeth Hixon, R.N., Marianna, Fla., Staff Nurse, Bureau of Child Hygiene and Public Health Nursing, State Board of Health

George W. Hug, Salem, Ore., Instructor in Health Education, University of Oregon

Howard B. Iglehart, Seguin, Tex., Public Health Engineer, City Board of Health

Paul E. Laird, B.S., M.A., Durant, Okla., Department of Health, State Teachers College

John B. McCreary, M.D., Harrisburg, Pa., Deputy Secretary of Health, State Department of Health

Sarah McGiffert, Chicago, Ill., In charge of Health Education in City Schools

Thomas D. Maher, M.D., San Francisco, Calif., Director, Child Hygiene, City Board of Health

Benjamin F. Matheny, Clarksburg, W. Va., City Health Officer

Florence C. Owen, R.N., De Kalb, Ill., School Nurse and County Supervisor of Child Hygiene

Roe E. Remington, Ph.D., Charleston, S. C., Professor of Nutrition; Director of Food Research, State Medical College

George L. Robinson, C.E., New York, N. Y., Design and Construction of Sewage Disposal Plants and Water Supply

Joseph A. Sauls, Jr., Houston, Tex., Engineer and Director of Sanitation of Water Supply, City Board of Health

Samuel W. Tay, B.S., Honolulu, T. H., Director, Bureau of Sanitation, Territorial Board of Health

Clara T. Warne, R.N., Los Angeles, Calif., Official Organizer of Birth Control Clinics in the State

Elizabeth A. Woodworth, M.D., Minneapolis, Minn., Bacteriologist

Dorothy Worthington, M.D., A.B., White Plains, N. Y., School Physician

Dorothy E. Wright, R.N., Jersey City, N. J., Instructor in Health Education, State Normal School

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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

PREPARATION OF ANNUAL REPORT

W. H. ENNEIS, M. D.

Deputy Health Officer, Knoxville, Tenn.

FOR four successive years the Knoxville Bureau of Health has mimeographed its *Annual Report,* containing on an average 100 pages, about three-fourths of which contain tables, charts and graphs. Everything in it is mimeographed, even the covers which carry a coat-of-arms and appropriate lettering.

On two occasions the material was submitted for an estimate of the cost of printing, and each time the price exceeded the amount available for this work. This condition is largely due to the charges for the reproduction of graphs, maps and charts. Two hundred and fifty copies of the 1928 report containing 89 pages were produced at a cost of 38½ cents each. These costs are itemized as follows:

Paper—pen point mimeograph (25,000 sheets)	$50.00
Stencils—108	18.00
Ink—2 lbs.	10.00
Covers	4.50
Cost of binding	13.75
Total	96.25

Labor is not included in the above figures since the work was done altogether by regular employees over a period of several weeks. During the winter of each year a number of days are so inclement as to interfere seriously with active field work of the sanitary inspectors. This time has been partly utilized by having these men operate the mimeograph machine and assemble pages, as well as do other work incident to the preparation of the report.

At the end of the calendar year practically all necessary statistical data are available for the year, as monthly progress reports are made of all activities of the bureau. The chief difficulty lies in assembling this material into graphic, tabular and narrative form for illustrative purposes.

All stencils requiring the use of the typewriter are cut by one typist who is selected because of her skill and experience with that particular kind of work. Such practice minimizes repetition and waste of material and insures a certain degree of uniformity. The person who cuts stencils for graphs and charts must have some knack for draughtsmanship.

All stencils are preserved so that during the year the material may be used in a weekly letter to physicians and as other enclosures. They are also used in lectures to classes in sanitation and in public health nursing.

For those health organizations desiring large numbers of reports for distribution, the cost of printing would certainly be less than mimeographing. To produce more than 250 copies by the mimeograph method would be burdensome and impractical. However, the experience of this bureau has been that this number of reports or less can be produced at a very reasonable price within our own organization.

AN EXPERIMENT IN MEASLES CONTROL

JOHN P. KOEHLER, M. D.

Commissioner of Health, Milwaukee, Wis.

DURING the first 6 months of 1929 there were 12,949 cases of measles reported to the Milwaukee Health Department. The epidemic reached its height on May 17 when there were 2,230 cases on hand. As usual, most of the cases were among preschool children and those in the kindergarten and lower grades.

When measles becomes epidemic in a school, very few susceptibles escape. Many parents appealed to the Health Department to close the schools. Not feeling justified in doing this, the Health Department decided to try a procedure that would make it possible for children who had never had measles to remain at home. It was decided that every schoolroom that had 10 per cent or more of its children absent on account of measles be ordered closed. Only cases that were reported during a period of a week were counted. The children attending these infected rooms were not sent home until the close of school at noon or in the afternoon. This was done to avoid any unusual disturbance in school. An exclusion slip was handed to every pupil, informing parents that he was excluded for 2 weeks unless a blank certificate which accompanied the exclusion slip was filled out and signed by parent or guardian stating that the child had had measles, in which case he was permitted to return to school at once.

This procedure was carried out from May 5 to June 13 inclusive. Practically no complaints were made against this new practice by the school authorities, teachers or parents. Children who were excluded were ordered to remain at home, away from all other children, but their homes were not placarded. This procedure was carried out in 57 parochial and public schools, and in 128 classes, distributed as follows: 26, kindergarten; 64, 1st grade; 34, 2d grade; and 4, 3d grade.

The enrollment of the various rooms that were closed was 5,104. The number of cases reported from these rooms before they were closed was 995. There were 3,480 excluded, of whom 2,408 returned to school with certificates stating that they had had measles; 1,072 remained at home because they had never had measles. Of the number that remained at home for 2 weeks, 171 developed measles. Of the 2,408 that were permitted to return to school because they brought certificates, 42 developed measles. Out of the total number excluded for 2 weeks, 11 developed measles after they were permitted to return again to school. The 42 children who were certified as having had measles and who developed the disease later, were mostly from schools in poorer neighborhoods. Forty-two is not a large number and speaks very well for the honesty of parents. The fact that only 11 children developed measles after their 2 weeks exclusion from school, proves conclusively that either most of the children that were excluded were immune or that there was no further exposure after they returned to school. In no case was it necessary to close a room for a second time.

About 2 weeks after this practice had been inaugurated we noticed a decline in the number of measles cases reported. Whether this decline was due to the fact that the epidemic had run its course, or to the isolation of sup-

posed susceptibles, is difficult to determine. We believe, however, that the experiment was well worth trying if for no other reason than that it permitted parents to keep their susceptible children home without having any difficulty either with the children or with the school authorities.

The tendency of the health officer in the past has been to do nothing that might interfere with the school attendance of a child. We will probably all agree that nothing is gained in closing schools during epidemics, but wherever it is possible to isolate susceptibles in highly infected rooms, it is at least worth trying.

This same procedure has also been used by the Milwaukee Health Department in connection with an epidemic of scarlet fever in one school. All children were excluded and only those that showed a negative Dick test were permitted to return. The same practice might also be used in the control of other contagious diseases.

LABORATORY

C. C. YOUNG, D. P. H.

NOTES ON LABORATORY TECHNIC

PHILIP H. LOHREY AND JOHN J. DUNN, JR.

Bureau of Bacteriology, Baltimore City Health Department, Baltimore, Md.

THE following short notes record some results which we have found helpful and which may be of use to other laboratories.

We have found in the first place that beef extract can be substituted for the beef infusion used with satisfactory results in the manufacture of Loeffler's blood serum. In cultures from 100 throats containing the diphtheria bacillus the diphtheria bacillus grew on beef extract serum in every case as well as on beef infusion serum, and the growth was as luxuriant in one case as in the other. The beef infusion broth is much more expensive, and the use of beef extract broth lessens the danger of contamination, since it can be made up in smaller quantities. We have therefore adopted this method, as recommended in Wadsworth's *Standard Methods,* in place of the more troublesome beef infusion method.

We have also found it quite convenient to sterilize wooden swabs for throat work in lots of 10, 25, 50 and 100. These swabs can be used by throat inspectors in houses to be released from quarantine, and in mass cultures taken from institutions, without any material waste of swabs, owing to the different number of swabs in the various packages. These bundles are wrapped in brown paper and folded so that they can be sealed with gummed paper in such a way as to prevent contamination.

Berry and Smeaton[1] showed that many specimens of sputum from tuberculosis negative by the direct smear were found to be positive by the Kinyoun method with antiformin and ligroin. Since many laboratories apparently still use the direct smear we thought it might be advisable to call attention to the above work, and also

to describe some comparative work between the direct smear and the Kinyoun method which we have carried out. The Kinyoun specimens were stained by the Ziehl-Neelsen and the ordinary smears by the Schulte-Tigg[2] method.

In 50 examinations of suspected tuberculous sputum we found 14 positive by both methods. We counted the number of tubercle bacilli present in 50 fields, and found that the Kinyoun method yielded 2,606, while the direct smear gave only 1,407. Most of the Kinyoun specimens showed more organisms than the direct smear, although occasionally the latter showed a few more organisms than the former. Such contrasts, however, as 250 bacteria per 50 fields by the Kinyoun method and 63 by the direct smear, 356 to 4; 200 to 13; and 75 to 20, show that specimens of sputum prepared by the Kinyoun method usually contain far more bacteria per 50 fields than those by the direct smear. In early and arrested cases particularly, the chances of finding a few organisms are greater when the Kinyoun method is used than when the direct method is employed.

REFERENCES

1. *Collected Studies from the Bureau of Laboratories of the Department of Health of the City of New York*, V, 7: 308, 1912–13.
2. *Deutsche med. Wchnschr.*, 56, 44: 1225 (Oct. 28), 1920.

THE DIAGNOSIS OF *BRUCELLA ABORTUS* INFECTION IN THE UDDER OF THE COW*

J. P. TORREY

Department of Bacteriology, Michigan State College, East Lansing, Mich.

THE relation of *Brucella abortus* to public health is being recognized by more people all the time. The fact that man may become infected by drinking milk which contains *Br. abortus* has been well established and furnishes a problem which concerns public health men.

The available means of eliminating milk infections are not always practiced and cannot be applied in many cases. Pasteurization is not practical under rural conditions, and is not effective unless properly done. If a clean herd is desired for raw milk it is the practice to identify the infected animals by blood serum reactions rather than bacteriologic examinations, since guinea pig inoculations and cultural methods are slow and expensive. However, the sale of all cattle whose blood reacts to the agglutination test for the purpose of eliminating those animals excreting *Br. abortus* in their milk is not necessary since, in the writer's experience, only 50 per cent of the animals which show a blood reaction carry the *Br. abortus* organism in the udder.

By the application of the Huddleson rapid agglutination test to the milk, practically all animals carrying *Br. abortus* in the udder can be detected. The first few streams from each quarter are drawn into clean test tubes or vials. The strippings should never be used. A composite sample is of little value since only one quarter may be infected. About 3 drops of rennet are then added to the milk and mixed thoroughly. The tube may be put either in an incubator at 37° C. or in warm

* No. 19 (N. S.) Mich. Agr. Exp. Station.

water at about 40° C. If the tubes can be placed in a slanting position, the curd will settle to one side and clear milk serum, with which the test is made, will separate. Serum will form in about 2 hours and may then be used the same as blood serum in the rapid test described by Huddleson.[1] Tests may be made as soon as the serum separates; but, if the sample can be placed in an icebox or cold place, the fine particles of curd will settle and leave a much clearer serum. Sour milk will give an unreliable test. Milk in which the curd has become partially digested cannot be used as this interferes with the test.

This test may be used by an experienced person at the owner's barn to pick out the animals carrying the abortion organism in the udder. If the samples are to be sent to a laboratory, the milk serum should be allowed to form and then poured into another well cleaned bottle or vial. A few drops of an iodine or chlorine disinfectant will prevent the samples from souring.

This test is approximately 98 per cent perfect and may be employed to advantage by city inspectors and city health authorities. Its simplicity and accuracy are such that it can be recommended in preference to any cultural methods known to the writer.

The experimental data on which the above discussion is based will appear in the near future.

REFERENCE

1. *J. Infect. Dis.*, 42: 242, 1928.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Residence Influence on Cancer Deaths in New York State—This is a study of the influence that residence has on cancer death rates recorded in New York State in 1926 and 1927. The number of deaths from all forms of cancer in the entire state for those 2 years was 27,889; of these 14,479 occurred in New York City, and 13,410 elsewhere in the state. Of the total deaths in New York City, 14,265 were residents of the city and 214 were residents of the rest of the state. The upstate total of 13,410 included 215 New York City residents. The number of cancer deaths in 1926 and 1927 for the various state institutions which are regarded as separate registration areas, numbered 215, all but 32 of them being in hospitals for the insane. The total of recorded deaths from cancer in the state, exclusive of New York City, included 17 residents of foreign countries and 204 residents of other states.

The rates for the urban and rural sections, exclusive of New York City, were affected considerably by the residence element. The number of deaths for the urban district, exclusive of New York City, was 8,441 and of these 7,570 were urban residents, 70 residents of New York City and 801 residents of rural New York. Taking into account the 138 urban residents who died in New York City, 229 in the rural territory and 79 in institutional districts, the total deaths of urban residents numbered 8,016. The recorded urban rate was 125.8 per 100,000 population, the resident rate 119.4. Deaths recorded in rural New York numbered 4,754 and of these 4,456 were rural residents; 69

residents of New York City, and 229 residents of urban communities. These in addition to the 921 who died in other parts of the state made the total resident rural deaths 5,377.

The recorded death rate of rural New York was 116.7 as against 132.0 for the resident rate. Rural residents who died in urban territory represented 15.2 per cent of all rural deaths from cancer while only 2.9 per cent of the deaths of urban residents were recorded in the rural part of the state. The recorded urban rate was higher than the rural rate by 7.8 per cent while the resident rate was lower than the corresponding rural rate by 9.5 per cent. The resident rate of cities from 10,000 to 25,000 considered as a group, 120.0 per 100,000 population, was lower than the recorded rate, 128.0, while in the group of small urban communities under 10,000 the resident rate was higher, 124.9 and 119.6, respectively.

The death rate of the rural territory was directly influenced by the unfavorable age composition of its population and when this fact was given due weight, the resident mortality in the rural area was found to be not higher but probably somewhat lower than in the urban part of the state.—J. V. De Porte, *Am. J. Hyg.*, 10: 201–228 (July), 1929.

Official Vital Statistics of Ireland—The Health Organization of the League of Nations has published a handbook which describes the procedure of the gathering of vital statistics in Ireland. The description is divided into 3 parts, the first for Ireland as a whole prior to 1922, and the other 2 dealing with conditions applying separately to the Irish Free State and to Northern Ireland since 1922.

Prior to 1922, a Census Act was passed during the summer months of the year preceding that in which the census was to take place. The country was divided into enumeration districts, each of which was controlled by an officer of the Dublin Metropolitan Police who acted as the local census enumerator for the district. These reports were sent to the Registrar-General in Dublin. The present systems in both the Irish Free State and Northern Ireland are continuations of the system in use prior to 1922. Among the changes introduced after the establishment of the Irish Free State, was the centralization of all economic statistics, including population statistics, under the Department of Industry and Commerce. The Statistics Act was promulgated in 1926 and provided for an enumeration of the population on April 18, 1926. The system of organization throughout was substantially the same as that prior to 1922. In northern Ireland, the department of the Registrar-General was merged with the Ministry of Finance in 1921 and the latter is responsible for duties formerly carried by the Registrar-General. A Census Act provided for an enumeration of the population on the same date as that of the Irish Free State. The country was divided into census districts and these into enumeration districts, each of which was controlled by a member of the Royal Ulster Constabulary. The actual operation was carefully organized.

Prior to 1922, living births had to be declared to the registrar within 42 days by the parents or other appropriate persons. In default of declaration within the time limit, a fine was incurred. After the expiration of 12 months, the written authority of the Registrar-General had to be obtained to effect registration of the birth. Stillbirths were not registered. The Irish Free State and Northern Ireland both introduced the system used prior to 1922. The certificates are identical to those previously used. In 1923, the Irish Free State began allocating births and deaths

occurring in institutions and elsewhere to the areas of normal residence of the mother or deceased person respectively, instead of to the area in which the death had occurred as was previously done. This same system was adopted in Northern Ireland in 1924. A person present at the time of a death or other appropriate persons were responsible for notification to the registrar of the district within 5 days after the occurrence of the death. The systems for registration of deaths in the Irish Free State and Northern Ireland are identical with that which functioned prior to 1922.

Under the old system, there were 10 infectious diseases that were compulsorily notifiable by the head of the family, or other appropriate persons and also by the medical attendant. A fine was imposed by failure of the proper person to notify the officer. The local authorities could enforce disinfection of premises, but were not obliged to do so. Vaccination has been compulsory since 1863 and every child must be vaccinated before it is 3 months old. The various measures governing the notification of infectious diseases and the procedure followed in the Irish Free State and in Northern Ireland, are substantially the same as those formerly applied to Ireland as a whole.—League of Nations: Health Organization: *Statistical Handbook Series: No. 11,* Geneva, 1929.

Health in Glasgow—The annual report for 1928 has been issued by the medical officer of health of Glasgow. The population was estimated at 1,147,108. The registered births numbered 23,649, giving a rate of 20.62 per 1,000 population, which is the lowest on record. The total number of deaths was 16,729, representing a rate of 13.7 per 1,000, which is the same as in Edinburgh. The infant mortality rate was similar to that of the previous year —107 per 1,000 live births. The maternal mortality rate of 8.79 per 1,000 births was higher than in the preceding 2 years.

The rate for infectious diseases was greater than in 1927, primarily because of the larger number of fatal cases of measles. The figures for tuberculosis were much the same as in the previous year. There were 1,247 deaths from malignant diseases, a reduction of 81.

Treatment of venereal diseases is carried out in 6 of the 13 maternal and child welfare centers. It has become the practice to take blood for the Wassermann test from every pregnant woman attending the municipal antenatal clinics. Of 584 pregnant women so examined, 29 were found to be infected with syphilis. Glasgow is the only area in the United Kingdom in which trachoma is a notifiable disease. Of 127 cases, 111 were born in the British Isles; the age group 15 to 20 had the largest number of cases. An examination of the home contacts of 33 cases notified in 1928 yielded only one case of definite trachoma.—*Brit. M. J.,* 2: 120 (July 20), 1929.

Vital Statistics for France, 1928—The minister of hygiene has published the vital statistics of France for 1928. The birth rate rose from 18.1 per 1,000 population in 1927 to 18.2. The death rate of 16.5 per 1,000 population for 1927 remained the same for 1928. The excess of births over deaths was 70,205 as compared with 65,042 in 1927. The difference in the number of births and deaths for 1928 is the highest since 1924, which shows an excess of 74,577 for the year. The total mortality for France would have decreased to a greater extent if the infant mortality had not increased from 61,817 to 68,100. During the third quarter of the year, 51 per cent more children died under one year of age in 1928 than in 1927.

The infant mortality rate in 1928 was 91 per 1,000 live births, as compared with 83 in 1927 and 97 in 1926.

The results for the first quarter of 1929 with relation to the corresponding period of 1928 have been announced. In the first quarter there was an excess of 70,205 deaths over births. In the corresponding period of 1928, there was an excess of 7,733 births over deaths, and in 1927, an excess of 32,252 deaths over births.

The excess of deaths over births for the first quarter of 1929 is due to a slight decrease in the number of births, and also to a marked increase in the number of deaths. This increase is due to the epidemic of influenza, and to an exceptionally cold winter which increased the mortality from diseases of the respiratory system.—*J. A. M. A.*, 93: 705 (Aug. 31), 1929.

Porto Rico Mortality Statistics, 1928–29—An increase in the mortality of Porto Rico was reported for the fiscal year 1928–29, particularly during the months immediately following the hurricane of September 13, 1928. The deaths directly attributed to the hurricane numbered less than 300. A comparison of the deaths registered in the months following the hurricane with the corresponding months of the preceding year showed a significant increase.

The number of deaths registered in 1928–29 was 40,890 as compared with 29,682 deaths registered in 1927–28, an increase of 11,208 deaths. The death rate for 1927–28 was 20.4 per 1,000 population as against 27.7 for 1928–29. The greatest increases for individual causes were recorded from dysentery (all forms) and influenza (all forms) which increased 882.1 per cent and 730.7 per cent respectively. Diarrhea and enteritis for all ages increased 43.2 per cent, uncinariasis 55.4 per cent, senility 53.6 per cent and congenital debility 40.5 per cent. The lowest proportional increases were recorded from cancer (all forms) 4.2 per cent, tetanus 7.7 per cent, typhoid fever 10.5 per cent, tuberculosis (all forms) 23.1 per cent and all external causes 24.6 per cent.

The increase of 1,710 deaths from diarrhea and enteritis 2 years and over was due in part to the correction of a statistical error in tabulating, children 2 years old having been included in the group under 2 years instead of in the group 2 years and over. A comparison between the mortality of 1928–29 and that of the preceding 5 years showed that the increase began in September. The average number of deaths that occurred in each month of the 5-year period was considered as normal. For July and August, 2,760 and 2,598 deaths respectively were reported and these figures corresponded to the normal. In September, there were 3,121 deaths or 675 over the normal figure. The mortality rose abruptly during the months of October and November. In December, the greatest number of deaths was recorded, 4,436, an increase of 1,744 deaths over the normal figure. The rate began to decline rapidly in January.

The average annual number of deaths registered in Porto Rico for the 5-year period, 1923–24 to 1927–28, was 30,560. The deaths for 1928–29, 40,890, showed an increase of 10,330 deaths which represented an increase of 33.7 per cent in the mortality.—M. A. Peréz, *Porto Rico J. Pub. Health and Trop. Med.*, 5: 54–58 (Sept.), 1929.

A Study of Autopsies in Haiti—A series of 700 consecutive autopsies were performed at the Haitian General Hospital, Port au Prince, from June, 1926, to January, 1928. The hospital is centrally located and the findings should be fairly representative of the mortality rate of the island.

The most outstanding cause of death

was pulmonary tuberculosis, which caused 26 per cent of the total. Lobar pneumonia caused 55 deaths. The gastrointestinal system was responsible for death in 33 or 4.7 per cent of the cases. Of these, 10 were due to typhoid in 1927 and 3 in 1928. No deaths resulted from bacillary dysentery or intestinal protozoal infestations.

Cirrhosis of the liver is not especially common, there being only 10 cases in this series and only 3 of these of the typical atrophic type. Acute nephritis is rare although chronic nephritis is quite common, causing 61 or 8.7 per cent of the total deaths. Endocarditis, both acute and chronic, is rare in Haitians. Two cases of acute mitral disease were found in terminal acute infections and 5 of chronic endocarditis.

Malignant disease was found to be just as common in Haitians as among people in the temperate zones, and the cell type differed in no way from those common to Caucasians. There were 21 deaths from malignancy in this series. Distant metastases were not common. Over 65 per cent of the cases had a clinical history of either syphilis or yaws infection at some time during life. There were 10 definite cases of yaws, 8 of which were aneurysms of the aorta, one a gumma of the brain and the other a spontaneous cerebral hemorrhage.—R. M. Choisser, *U. S. Nav. M. Bull.*, 27: 551–568 (July–Oct.), 1929.

Malaria Survey of Island of Jamaica—Malaria in Jamaica is largely, if not altogether, confined to the coastal plain lowlands. For the last 20 years the intensity of the disease over the entire island has been diminishing. The number of reported deaths from malaria from 1880 to 1900 had a sharp upward trend and after 1910 had an equally strong downward trend. A further study of incidence made from records of 19 general hospitals on the island corroborated the trends revealed by the mortality statistics. There was a decided parallelism shown between rainfall and the intensity of malaria. Of 15 separate years in which peaks of malaria incidence occurred, in 6 cases the rainfall during the same year was excessive. The seasonal distribution of malaria was studied using as a basis 61,097 cases admitted to hospitals on the island from 1910–1919. This showed the minimal incidence in May with a peak in August and a further increase until the annual maximum was reached in November.

In order to secure further data for determining the distribution and incidence of malaria, an examination of a random sample of children attending government schools was made. The entire group numbered 11,998; both sexes were included and the majority were between 5 and 14 years of age.

Splenomegaly was used as an index to the distribution of malaria. The children were tested for enlarged spleens; all of those showing splenomegaly and one-half of those with normal spleens were tested for parasites. Of the 5,742 children with normal spleens 318 or 5.54 per cent showed parasites and 256 or 36.5 per cent of the 703 children with enlarged spleens harbored parasites. From these data, the distribution of malaria was determined, schools in which parasitic or splenic indices were in excess of 25 per cent representing areas of high malaria endemicity and indices below that as areas of low or moderate endemicity. The highest splenic and parasitic indices were found under 500 feet of elevation, the next highest from 501 to 1,500 feet and generally none above 1,500 feet.—M. F. Boyd and F. W. Aris, *Am. J. Trop. Med.*, 9: 309–99 (Sept.), 1929.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Treatment of Waste Waters From Abattoirs—The writer of this article describes 2 methods found quite successful under certain conditions for the treatment and disposal of the characteristic abattoir waste water in unsewered districts.

The first method described is that of absorption by the soil under certain refinements as to preparation and cultivation of the area to be used. For a 3,000-gallon per day waste, 5 to 6 acres of land are fenced off, ploughed lengthwise and crosswise to a depth of 8″, divided into 2 sections, each of which is again subdivided into 5 plots, each plot being harrowed and graded so that the cross-section is fairly level and longitudinal section has a fall to lower end. Each plot, assuming 5 working days, will care for one day's water per week. The care and operating attention which should be given is described, particularly as to trenching, harrowing, and rotation in use of plots.

Another method found to be very successful is that of passing the waste water through a process by which the temperature is raised and then discharging it to a tank where chemical treatment is given and where it is allowed to stand for a precipitation period of 1 hour. The effluent, practically clear by this time, is then filtered through a sand bed. The necessary plant for this type of treatment comprises a steam pipe from the boiler, with valves for regulating the supply of steam, 2 ejectors, pipes and valves for regulating the flow of water to the ejectors, 4 brick or concrete tanks of varying capacity, and a sand filter bed. A rather complete description of the operating features of a plant of this kind is given, assuming a waste water production of 4,000 to 5,000 gallons per day.—W. J. Trevaskia, *Proc. of The First Commonwealth Conference on Public Health Engineering*, Commonwealth of Australia, pp. 207–211. Abstr. H. N. Old.

Studies Relative to the Significance of the Present Oyster Score—This paper is an excellent discussion of the results of a vast amount of laboratory work done in connection with the sanitary control of shellfish problems conducted by the State of Maryland. The importance of the article to those who are engaged in shellfish sanitation activities is such that the summary in full is quoted here as follows:

1. A comparison of the scores of over 400 water samples and the same number of corresponding oyster samples revealed a general trend for oyster scores to increase with increasing concentrations of colon-aerogenes group members in water. The effect of temperature on this relationship was also observed. The relationship was found to be about the same with water temperatures of 60° F. or less and above this temperature. In no case could the relationship be expressed by means of a fixed ratio. Individual oyster scores varied so consistently and widely from the hypothetical value that it was found impossible to estimate oyster scores with any degree of accuracy from a knowledge of water scores, tides, and temperature.

2. A remarkably close correlation was found between oyster scores and temperature. In considering 363 oyster samples from 2 areas a score of 50 or more was seldom found with water temperatures of 60° F. or less, whereas with temperatures of 75° to 85° F. seventy per cent of the oyster samples had scores of 50 or more and nearly fifty per cent 410 or greater.

3. The score of shucked oysters must be interpreted differently than the score of fresh shell stock. The former score indicates the degree of care in the packing process. Increased scores and total 37° C. bacterial counts have been found to result chiefly from unclean utensils. Lack of plant cleanliness and proper refrigeration permit multiplication of bacteria present in the shell stock or introduced during the handling process. Due to the fact that both the total 37° C. bacterial count and the score of shucked oysters represent a general lack of cleanliness rather than fecal contamination, the more inclusive total 37° C. bacterial count has been found particularly valuable for indicating the efficiency with which an establishment is being operated. There is apparently no reason why oysters cannot be packed in such a way as to give results just as satisfactory as those obtained in an efficient dairy for the production of certified milk.

4. The general topography of a body of water together with the effect of winds and tides causes stratification of water. In some cases, this condition may become so pronounced that water of excellent bacterial quality may be found at the surface while water grossly polluted may exist near the bottom. The average 37° C. bacterial count for all samples from the bottom was consistently higher than for samples taken just beneath the surface. Due to the fact that the water near the bottom obviously most influences oysters and the wide variations in bacterial content which may occur, the most satisfactory routine procedure is to secure bottom samples under tidal conditions judged to produce maximum pollution.

A bibliography of 14 references is appended.—C. A. Perry, *Am. J. Hyg.*, 8, 5: 694–722 (Sept.), 1928. Abstr. H. N. Old.

Sodium Aluminate as a Coagulant in Chemical Treatment of Cannery Waste Waters—The H. J. Heinz Company discharges a large volume of tomato waste which finally finds its way into the city storm sewer and then flows out into a farming community. This organic matter in the sewage putrefies rapidly and gives off offensive odors. A successful attempt was made to treat the cannery waste with lime and sodium aluminate. This solution was made up of 1 pound of lime and 0.16 pound of sodium aluminate to a gallon of water and was added to the waste in sufficient quantity to produce a good floc and to yield a pH of about 10. The effluent is stable and has no turbidity. No odor was noticeable in the ditch over a mile below the cannery.—J. A. Holmes and G. J. Fink, *Indus. & Eng. Chem.*, 21, 2: 150–151 (Feb.), 1929. Abstr. Frank Raab.

Abating Black Smoke Will Not Solve the Problem of Atmospheric Pollution—The general conception is that the abatement of black smoke prevents atmospheric pollution. This is not the case, however, because the elimination of black smoke does not necessarily prevent pollution of the air with ash particles and large quantities of sulphuric acid. In fact, the more efficient combustion of pulverized fuel leads to a marked increase in the amount of fine ash in the products of combustion. Elaborate studies reveal that the size of the suspended solids range from 0.2 to 1.5 microns. These small particles do not settle as in the case of the grosser soot and, therefore, a measure of the so-called "soot-fall" is not a satisfactory measure of the seriousness of atmospheric pollution. Studies in Cleveland indicate that there are 3 mg. of suspended solids per 100 cubic feet of air. Calculations indicate that this quantity of suspended solids amounts to 20,000 tons per year per square mile of city area when only the lower 200 feet of atmosphere is considered in the calculation and when the mean wind velocity of 11 miles an hour is utilized. The author concludes, therefore, that atmospheric pollution can only be abated by preventing ash and sulphuric acid from being discharged into the air from stacks.

Three methods of treating the products of combustion to remove undesir-

able constituents are mentioned; namely, electrical precipitation, centrifugal collection and bag filtration. It is admitted that sulphuric and sulphurous acids have not been removed from products of combustion; yet the possibility of washing the products of combustion with lime solution is mentioned. —R. D. MacLaurin, *Am. City*, 40, 5: 135–137 (May), 1929. Abstr. Charles R. Cox.

Small Filters for Household Use —Small filters for household use where there is no regular controlled supply must fulfil 2 purposes—they must clear the water of suspended matter and they must remove bacteria. It is also necessary that purification, sterilization and renewing of filter material shall be simple, convenient and cheap. No filter in continuous use remains impervious to bacteria and therefore a filter material is necessary which can be sterilized easily by boiling.

The earliest form of small filter was the clearing filter of charcoal. Then with the use of clay and porcelain came true bacterial filters. China filters in candle shape were introduced by Chamberland and with a development of this—the Berkefeld filter—with daily sterilizing a continuous germ-free filtrate can be counted on with a considerable degree of certainty. Other developments are the Doulton filter and one produced by the Seitz Works in Kreuznach, in which the filter material consists of specially prepared asbestos boards.

The chief difficulty lies in the fact that, in spite of attention and purification, bacteria grow through filter material and pollute the filtrate. This has been found to be preventable by the destruction of the bacteria in the filter by metals or metallic compounds, especially metallic silver. Bechhold has worked out an impregnating compound, the composition of which has not been divulged, and has tested its effect on filters of porcelain, kieselguhr and charcoal. The best results were obtained with porcelain filters with an average pore size of 3.8–10 microns and kieselguhr filters with somewhat bigger pores. An impregnated kieselguhr candle-shaped filter worked 5 months giving an exceptionally sterile filtrate.

Experiments were made with a filter supplied by a Hamburg firm in which the filter material was made of kieselguhr, kaolin and cement pressed into a metal case under heat while air was blown through under slight pressure. The filter core can be easily removed and renewed.

The density of the filter was tested by blowing air through while the filter was immersed in water and the greatest pore width was calculated. The average rate of permeation per sq. cm. of surface was determined by allowing tap water to run through under slight pressure.

The removal of bacteria was found to be practically complete if the filter was sterilized before filtration, but frequent sterilization was necessary.

The filter appeared good for both clarification and removal of bacteria. It must, however, be made to fit the other requirements, ease and certainty of manipulation and cheapness.—*Strunk. Tech. Gemeindebl.*, 32, 10: 144, 1929. (From Papers of Water Pollution Research Board, England.)

The Drinking Water Supply in Holland—Great advance has been made in Holland in the distribution of water since the first water works were established at Amsterdam in 1853. In 1928, all the large towns, numbering about 70, and about 400 out of the 800 rural parishes possessed water supplies. In Holland the daily consumption per head, amounting to 98.5 litres, is low in

comparison with England and America, because the industries mainly possess their own supplies of water. The majority of the water works are under public administration. In 1913 a new section for dealing with all matters relating to water supplies was established under the Public Health Department. A short survey is given of the hydrogeological conditions of the country in relation to the water supply.

Underground water is obtained from the sand-dunes in the littoral region. Iron and manganese are removed from the water before use. Natural springs are very scarce and river water is used to a great extent. All surface water is purified by sedimentation and rapid filtration before distribution. Amsterdam and the Hague have a dune underground and Rotterdam, with Delft, Schiedam, etc., have a surface river supply. Reference is made to the new purification plants for river water at Zwijndrecht and for underground water at Zutphen.—W. F. J. M. Krul and F. A. Liefrinck, *Rapport en Mededeeling v. h. Rijksbureau v. Drinkwatervoorziening. Mededeling No. 8.* (Papers of Water Pollution Res. Bd., England.)

The Grading of Milk—The grades of milk in Scotland, as laid down by the Milk (Special Designations) Order of 1923, are: (1) certified; (2) grade A (T. T.); (3) grade A; (4) pasteurized; (5) grade A pasteurized.

Briefly, certified milk is milk produced from cows which are examined at least 3 times a year by a veterinary surgeon and which have passed the prescribed tuberculin test at intervals of 6 months. The milk must be cooled and bottled on the farm and is delivered to the consumer in these bottles, and must at no time contain more than 30,000 bacteria per c.c.; no coliform bacillus in 0.1 c.c. and not less than 3.5 per cent butter fat.

Grade A (T. T.) milk is derived from cows which have passed the prescribed tuberculin test, but the milk need not be bottled on the farm by the producer. The milk must not, at any time before delivery, contain more than 200,000 bacteria per c.c. and no coliform bacillus in 0.01 c.c., and must contain not less than 3.5 per cent butter fat. It must not be heat-treated.

The requirements for grade A milk are the same as for grade A (T. T.) except that the cows need not be tuberculin tested. The cows must, however, be examined 3 times a year.

Pasteurized milk is heated to a temperature of 145 to 150° F. for one-half an hour and subsequently cooled to below 50° F. The type of equipment and methods employed must be satisfactory to the local health authority. Pasteurized milk must not contain more than 100,000 bacteria per c.c.

Grade A (pasteurized) milk is grade A milk which has been pasteurized. The bacterial count must not exceed 30,000 per c.c. and there must be no coliform bacillus in 0.1 c.c. The author discusses the various grades, giving the advantages, disadvantages, etc. —James McAllan, *J. State Med.*, 37, 4: 229–39 (Apr.), 1929. Abstr. P. R. Carter.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

Report of Committee on Industrial Fatigue*—The committee's work during the past year was chiefly educational. The coöperation of some group has been hoped for that would undertake a controlled study of the relative importance of the intrinsic factors in the causation of industrial fatigue as compared to the extrinsic factors. A wide distribution of the *Bibliography on Industrial Fatigue and Allied Subjects* has been made and a second printed edition prepared comprising a bulletin of 38 pages, which includes chiefly material published in English, from January, 1921, to May, 1929. Each citation is briefly abstracted. In the citations covered the committee is impressed by the continued neglect to consider the intrinsic factors in fatigue, such as the readily recognizable physical disabilities and the widely prevailing types of "silent" sickness or organic defects that have progressed to a point affecting the working power of the organism and yet not placing the sufferer on the sick list.

Recent analysis of 100,000 health examinations of insurance policy holders made by the Life Extension Institute, the research being conducted by Edgar Sydenstricker of the Milbank Fund, in coöperation with Rollo H. Britten of the U. S. Public Health Service, shows that there is an increase in the ratio of organic impairments with increasing age. It is noted that at the age 60 the impairment rate is more than three times that at 25. Impairments may not directly affect the work curve of a group but, what Benedict has so sweetly termed "autogenic reinforcement," has to be considered—the power of man to resist the onset of pathological fatigue, and the influence of training in enabling a skilled worker to maintain for a time the peak of activity even though, in a sense, ill and tempted to slow up.

From the above, the desire for a controlled study seems obvious, yet in the literature abstracted since 1928 no important research has given consideration to the intrinsic fatigue factors. The emphasis is still upon the environmental factors.

Here and there appears a ray of light. Joshua E. Hannum in the *Journal of Industrial Psychology* indicates that at the Whiting-Davis Company there was an increased production of 27 per cent in one month's time through the correction of vision in one department employing 200 operatives. Another article by C. Fenno Faulkner in *Factory* suggests a research on what types and conditions of men are physically unfitted to withstand continuous noise. Another article by Glen L. Gardner, also in the *Journal of Industrial Psychology*, makes the statement that probably more workers break down early in life from overworking their stomachs than their muscles. The question is asked: "Is the working population of this country in an ideal physical state, and if not how far below that state on the average?" As yet we have no answer.

* Abstract of the Report (Eugene L. Fisk, *Chairman*) presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

Requests for the second edition of the *Bibliography on Industrial Fatigue* should be made to Dr. Carey P. McCord, 34 W. 7th St., Cincinnati, O.; to the Chairman of the Committee, Dr. Eugene L. Fisk, Life Extension Institute, 25 W. 43d St., New York, N. Y.; or to the Association office, 370 Seventh Ave., New York, N. Y.

Report of Committee on Lead Poisoning*—The 2d Annual Report of the Committee on Lead Poisoning of the Section on Industrial Hygiene of the A. P. H. A. was presented at the Minneapolis Meeting. It includes (*a*) Standards and (*b*) A 2-page synopsis of the Bibliography for 1928, and as such comprises 56 pages in addition to a foreword, the whole submitted as a progress report upon the standards for diagnosis, clinical forms, terminology, and symptomatology; also, compensation relations in connection with the three usual classes of cases: (1) those with positive disability; (2) those with doubtful disability; (3) those without disability.

"Standards of treatment" devotes several pages to curative treatment, divided into that for immediate toxic manifestations, and that for "deleading." Standards for industrial control lay down a definite plan of procedure with directions for workplace hygiene, rules for personal hygiene, medical supervision, and the regulations of hours of labor.

The statement concerning Bibliography is a brief summary to the effect that 265 citations were listed for the year 1928, of which 112 were abstracted to the date of the report.

A mimeographed copy of the Report may be obtained by members of the Section at the cost of 10 cents. Others may obtain copies at 50 cents each. The *Bibliography*, which comprises 27 pages with approximately 10 items to the page, will be made available in mimeograph form at 75 cents per copy. An accompanying code enables most of the abstracts to be found readily in current abstracting journals, but the committee can supply copies of the abstracts made at a cost of 5 cents each for those not exceeding ½ page, and 10 cents for those longer. All communications concerning copies of either the Report itself or the Bibliography should be addressed to Dr. Carey P. McCord, Secretary, Section on Industrial Hygiene, 34 W. 7th St., Cincinnati, O. Those interested should communicate with the Secretary at once as it seems advisable to set a date for such requests not exceeding 60 days from the publication notice hereof, in order to estimate the ultimate number of copies to be made up.

Deaths from Lead Poisoning, 1925–1927—This is an analysis of lead poisoning from the mortality statistics of various civilized countries of the world, and reaches the conclusion that as a cause of death lead poisoning is decreasing materially (valuable case records, abstracts, quotations, and tables accompany).—Frederick L. Hoffman, U. S. Bureau of Labor Statistics, *Bull. No. 488*, June, 1929, 37 pp.

Progress of Ratification of the White Lead Convention—The Convention of the League of Nations covering the control of the use of white lead has been ratified by Cuba, Bulgaria, Chile, Czecho-slovakia, Estonia, Finland, France, Greece, Latvia, Luxemburg, Norway, Poland, Rumania, Spain and Sweden. It has been ratified likewise conditionally in Hungary; approved by competent national author-

* Abstract of the Report (Emery R. Hayhurst, *Chairman*) presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

ity in Italy and the Netherlands, and recommended to competent national authority for approval in Germany and Uruguay. Various forms of legislation are also reported in progress on the measure in Switzerland and other countries.—Table Insert, *Industrial and Labour Information,* 31, 10 (Sept. 9), 1929.

Medical Services for Seamen Ashore and Afloat*—Medical service for American merchant seamen was begun in 1798 by the U. S. Public Health Service, but it was not until 1881 that a medical hand book, *The Ship's Medicine Chest,* was prepared. Millions of dollars are now spent annually for the treatment of disabled American seamen, a service without cost to them. All seamen undergo a thorough physical examination before employment. If rejected, the applicant is informed of the nature of his defects and advised to have them corrected. A health record of each seaman is kept.

It is aimed to maintain standards of general sanitary conditions, ventilation, and heating on board, and for the latter purposes blowers are supplied. Food is rigidly inspected and supplied in sufficient quantity and quality. All food handlers are carefully examined each trip. A constant campaign against bed bugs, cockroaches, rats, and mice is maintained. There is little sanitary danger in the water used by ships. Salt water should not be used in a bath as it may be polluted. Standards are suggested for bathing and laundering facilities, heads and urinals, and waste disposal.

Employment records for the past two years show that 40 per cent of the rejections are for venereal diseases, while the Service has charge of the medical treatment of seamen ashore and is also promoting an extensive educational work in venereal and related fields (the ship's hospital and medicine chest are described). All ships carrying 50 or more passengers, other than those in the cabin, are required to carry a competent physician, while emergency treatment at sea can be promptly and usually adequately administered, for which medical advice by radio is arranged.

Maritime laws cover the matter of provisions and water, complaints in regard thereto, crew accommodations, medicines and antiscorbutics, care of bodies after death, washing accommodations on new vessels, and fumigation. In vessels constructed between 1895 and 1915 the law provided 72 cubic feet, and not less than 12 superficial feet, for each seaman or apprentice in the quarters allotted to him, this space to be kept free from goods or stores of any kind. For all vessels constructed after March 4, 1915, the law requires not less than 120 cubic feet and 16 sq. ft., respectively.—Lyle Jordan Millan, M.D., Examining Physician, Bureau of Operations, U. S. Shipping Board, Washington, D. C.

A Study of Body Radiation—Rubner states (see page 20, Leonard Hill, *The Science of Ventilation and Open Air Treatment*) that "for an average man, in still air, the loss of heat is distributed as follows: Warming of inspired air, 35; warming the food, 42; evaporation of water, 558; convection loss, 823; radiation, 1,181; total loss, 2,700 kg. calories." (From these figures it will be seen that approximately 44 per cent of the body's heat is lost by radiation; 31 per cent by convection; 21 per cent by evaporation; and the small balance, by the warming up of inspired air, ingested food, and miscellaneous loss.)

The present study bears out these

* Abstract of paper read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

findings of Rubner rather closely and would appear to indicate that not enough attention has been given to the factor of body radiation as a means of heat loss in mechanical heating and ventilation schemes, which have been principally directed toward loss of heat by convection.

Some results of the present study are:

1. The radiation from the skin and clothing is approximately that of a "black body" or perfect radiator.

2. (Omitted.)

3. A cloth-covered, vertical, cylindrical calorimeter at body temperature loses in still air 60 per cent by radiation, 40 per cent by convection. A similar horizontal calorimeter loses 54 per cent by radiation, 46 per cent by convection. The human body convection loss is probably similar to this; that is, the convection loss is roughly one-third less than radiation loss, in still air and normal room temperatures.

4. Increasing air motion rapidly decreases the percentage radiation loss and increases the convectional (loss).

5. (Omitted.)

6. Increase in room temperature (which also means increase in wall temperature) produces a progressive lowering of radiation loss. The ratio, radiation loss vs. basal metabolism, decreases with increase of room and wall temperature.

7. (Omitted.)

8. At normal indoor temperature, in still air and with the subject normally clothed and at rest, body heat losses are distributed as follows:

Evaporation of water	24 per cent
Radiation	46 per cent
Convection	30 per cent

9. Air temperature falls to room temperature very rapidly as the distance from the body increases, so that at a distance of 30 cm. (about 1 ft.) no effect of the presence of the body could be detected.

10. The Abbot-Benedict work indicates that the radiation loss from a nude subject is about twice as great for a room temperature of 15° as it is for a room temperature of 26° C. This evidence does not entirely support the "suit of clothes" theory referred to by Du Bois. In explanation of this theory, he says (p. 385, 1927 Ed. "Basal Metabolism"): "A constriction of the peripheral blood vessels (occurs) and the amount of heat carried to the surface is relatively small in proportion to the heat produced. The patient really changes his integument into a suit of clothes and withdraws the zone where the blood is cooled from the skin to a level some distance below the surface."

11. Normal fluctuations in humidity indoors produce negligible effect upon the radiation loss. Our bodies radiate almost wholly between the wave lengths 4 μ and 50 μ with a maximum at 10 μ. Were the air of the room exceedingly dry, changes might be noticeable.

"Interesting and important questions concerning the comfort and welfare of children in classrooms are inadequately answered today. It is hoped that this report may in some degree help towards a better understanding of these problems."—L. B. Alrich, *Smithsonian Miscellaneous Collections,* 81, 6 (Publication 2980): 54 (tables and illustrations), Dec. 1, 1928.

Low Back Pain—The author discusses the subject from an anatomical, physiological, and evolutionary point of view, and considers, under causation, acute trauma, recurrent trauma, arthritis, malignant disease, anatomical variations, and muscular lesions (two pages of discussion accompany).—Fred C. Kidner, *Bull. Am. Assn. Indust. Phys. & Surg.,* III, 4: 1–8 (Oct.), 1929.

Special Pamphlets on Occupational Diseases—

Fume Poisoning from Nitric and Mixed Acids, *Safe Practices Pamphlet No. Chem. 2,* 3 pp., Illus.

Chemical Burns, Their Nature and Treatment, *Safe Practices Pamphlet No. Chem. 3,* 3 pp., Illus.

Carbon Monoxide, *Health Practices Pamphlet No. 7,* 5 pp., Illus.

Infected Wounds, *Health Practices Pamphlet No. 8,* 3 pp., Illus. National Safety Council, 108 E. Ohio St., Chicago, Ill.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Influence of Inorganic Elements on Blood Regeneration in Nutritional Anemia—Reference to the use of inorganic elements in addition to iron in the treatment of anemia is found in the older textbooks on therapeutics. These include arsenic, manganese, copper and mercury. Reference is made particularly to the work of Hart and Steenbock and coworkers (Abstract in *A. J. P. H.*, 18: 1058 (Aug.), 1928) who found that copper was essential in supplementing the iron to produce hemoglobin regeneration. In view of the effect of other inorganic elements such as manganese and germanium reported by other workers, the authors studied additional inorganic elements closely associated with copper in the atomic scale. All of the work was done on young rats which had been made anemic by whole milk diet soon after weaning. Marked regeneration was noted when manganese, nickel, copper, germanium and arsenic supplemented the iron in nutritional anemia in amounts of 0.05 to 0.5 mg. daily. Cobalt, 0.05 to 0.5 mg., had a slight effect. While these experiments will confirm the observations of other workers in the ability to secure regeneration with iron alone they do not confirm the experiments of Hart and Steenbock who found copper a necessary supplement. The authors reserve final decision on this discrepancy but feel the experiments have demonstrated the supplementing action of the elements named, all of which except nickel have in the past been recognized as therapeutic agents in anemia.—Victor C. Myers and Howard H. Beard, *J. A. M. A.*, 93: 1210 (Oct. 19), 1929.

Vitamin B Content of Different Yeasts and the Wheat Breads Made from Them—In these experiments using the protective methods in pigeons or rats 3 kinds of yeast were used, one brewer's yeast and two compressed yeasts, one of which was made from molasses and the other from a grain mash. In the case of pigeons 0.4 to 0.5 gm. of dry substance of molasses yeast was necessary to protect from vitamin B deficiency, as against 0.3 to 0.4 gm. of the grain yeast. In experiments on pigeons on a vitamin B free diet of polished rice, it was found that the content of the antineuritic factor of both of the compressed yeasts was less than that of the brewer's yeast, the latter being about three times as potent. There was found to be scarcely any difference in the case of anti-pellagric or growth promoting factor.

There is a possibility that the method of manufacture of compressed yeast is responsible for the total vitamin deficiency. In the case of bread, the experiment was limited by the difficulty experienced in inducing the pigeons to consume sufficient amounts of the diet to afford vitamin B protection. Bread containing three times the usual amount of compressed yeast did not afford protection.

In the experiments with rats it was evidenced that the bread made with baking powder was inferior to that made with yeast but satisfactory comparison between the different yeasts was impossible here because of the inability of the rats to consume sufficient bread. The authors conclude that to have added more yeast to the bread would

have materially altered the fundamental character of the bread.—Arthur Scheunert and Martin Schieblich, *Biochem. Ztschr.*, 212, Band. 1–3, Heft: 80 (Aug. 31), 1929.

Influence of Vitamins A, B, D, Iron, Copper, Beef Muscle, and Liver on the Course and Regeneration from the Anemia of Rice Disease—Among the factors in experimental anemia are the vitamins, and recent work has demonstrated that not only a stronger anemia develops in the absence of vitamin B, but that its addition is followed by more prompt recovery than in the case of vitamin A.

In this experiment adult male rats, after attaining a basal weight level, were placed on special diets for a 10-week period. Eight different diets were tried, chiefly rice with various supplements, and bi-weekly observations including body weight, erythrocyte counts and hemoglobin estimation were made. Polished rice diets, cooked and uncooked, resulted in a decrease in body weight and hemoglobin level, the former proportionately greater than the latter.

Supplements of cod liver oil as a source of vitamin A were of little or no benefit. The addition of 2 per cent of compressed yeast resulted in loss of only 5 to 10 per cent body weight and of only 3½ per cent in blood count with a parallel hemoglobin figure. A supplement of iron (ferric ammonium citrate equivalent to 10 mg. iron daily) resulted in a greater loss both in weight and in erythrocyte count than with rice alone. When both iron and copper were added, there was less loss of red blood cells than with iron alone but still greater loss than in the control groups.

Comparisons of diets were made by substituting lean beef for rice, adding 2 per cent rice, substituting liver for rice and cod liver oil, substituting liver for cod liver oil alone, and the addition of yeast. These substitutions resulted in a more complete remission of the anemia observed and the greatest effect was produced by the lean beef muscle followed in order by liver, yeast, liver added to rice and yeast, yeast added to rice, copper and iron, and yeast added to rice and iron. Weight recovery was complete in 4 weeks.—R. W. Whitehead and O. W. Barlow, *Am. J. Physiol.*, 89: 542 (Aug. 1), 1929.

Anti-Scorbutic Vitamin in Cabbage Soup, Cabbage Puree, and Turnip Juice—E. Tso (*Chinese J. Phys.*, 2, 4: 403–408, 1928). In an attempt to find inexpensive sources of vitamin C for infant feeding in northern China, the author has tested the possibility of utilizing the native cabbage (Brassica pekinensis) and Chinese winter turnip (Raphanus sativus) in the form of soup, puree, or juice. The cabbage soup was prepared by cooking shredded cabbage with an equal weight of tap water for 15 minutes' actual boiling time, cooling, straining, and adding table salt to taste.

The puree was prepared by cooking shredded cabbage for 15 or 20 minutes in as little water as possible and rubbing the material through a sieve. Turnip juice was prepared by grating the entire root, including the skin, and straining it through cloth. In the feeding experiments, guinea pigs weighing from 240 to 350 gm. were fed a basal diet of soy bean meal 30, mung bean flour 30, millet meal 30, sodium chloride 1, calcium carbonate 2, and cod liver oil 2 parts, the ingredients being made into a semi-solid paste by cooking for from 30 to 40 minutes with water in a double boiler.

On this diet death from scurvy is said to take place invariably within 4 weeks. From 2 to 3 animals were used for each amount of the materials tested. The minimum amounts for

protection against scurvy and normal growth during an experimental period of 5 months were 30 c.c. daily of cabbage soup, from 5 to 10 gm. of cabbage puree, and 20 c.c. of turnip juice, respectively.—*Exper. Sta. Rec.*, 61: 193–194 (Aug.), 1929.

Rye Bread Poisoning—Report of an outbreak of illness alleged to be due to the consumption of rye bread made from rye meal contaminated with ergot (Ashby and Robertson, *Brit. M. J.*, 1: 318, 1928) was the basis of an investigation conducted by the Ministry of Health of Great Britain. The object of the investigation was to obtain facts regarding the nature of the illness, its causation, the likelihood of similar outbreaks, and preventive measures for control.

There were about 200 cases involved in this outbreak, all the victims exhibiting similar symptoms, with the exception of one that developed gangrene. In general these symptoms were developed over a period of approximately two years, the indisposition starting with coldness of the feet, weakness of the knees, pain, headaches, general marked itching of the skin, blanching of the fingers, and severe formication.

Removal of rye bread from the diet resulted in convalescence and recovery. Investigation of the source of the rye used for the breadmaking revealed that in general the rye was grown in the districts of Yorkshire, Lancashire, Cheshire, Monmouth and Essex, where these crops are seldom, if ever, free from ergot infection. It was further ascertained that the rye was neither cleaned nor screened before being ground into meal. The rye meal was used in breadmaking in the proportion of 1 part rye to 4 parts wheaten meal. Very little of the rye was used in the form of rye flour in making this type of bread. Since this outbreak, Canadian milled rye flour, said to be free from ergot, has been substituted for the meal.

As a result of the investigation, the author presents the following interesting facts: That the rye bread is eaten to a large extent in the locality under investigation by Jews, and rye for these towns is obtained almost exclusively from the ergot infested districts. Practically all of the victims in this outbreak were of Jewish extraction.

On the assumption that some of the rye consumed in Manchester contained 1 per cent of ergot, a half-pound loaf of bread containing this rye as a constituent would contain 4 to 5 grains of ergot. It is possible, therefore, that if consumed over lengthy periods, especially if the ergot were in an actively toxic state, pathological conditions might ensue.

While the samples of rye actually examined were not found to be toxic, this may be accounted for on the ground that the samples were at least 6 months old, and that the methods of analysis were faulty. The clinical characteristics of the outbreak, as far as they have been investigated, strongly support the fact that ergot was responsible.

In view of the potential danger, preventive measures were recommended to be put into operation. Rye crops should be grown with the necessary precautions to reduce the risk of ergot infection to a minimum. For human consumption, it is necessary to remove by suitable methods any small proportion of ergot which the rye may contain.—M. T. Morgan, *Brit. J. Hyg.*, 29: 60 (Apr.), 1929.

Influence of "Chilies" (Capsicum annum L.) on Digestive Functions and Metabolism—The widespread use of chilies or capsicum in tropical countries has led to this experiment to determine the effect on the gastric, salivary and other secretions. The effect of capsicum on the flow of saliva

was studied both in man and dog and found to produce copious secretions. Gastric secretion in dogs was studied and it was found that the mucous secretion was slightly increased, but it does not affect the acidity of gastric juice, nor of the gastric response. Slight increase in gastric motility in dogs was noted. In the case of individuals accustomed to eat peppery food, capsicum was without effect on the basal metabolism in amounts up to 100 gm. fresh capsicum. The opinion is offered that those accustomed to eating capsicum may have developed a conditioned reflex.—Te-Pei Feng, *Proc. Soc. Exper. Biol. & Med.*, 26: 273 (Jan.), 1929.

Experimental "Food Poisoning" in Monkeys with Living Paratyphoid Bacilli—Since in previous experiments the symptoms of food poisoning were not reproduced when enormous numbers of heat-killed paratyphoid bacilli were fed to monkeys and other animals, and no symptoms were produced when large amounts of heat-killed paratyphoid cultures were swallowed by human volunteers, it was concluded that the thermostable substance known to be toxic to animals on intraperitoneal inoculation is not the substance responsible for the gastrointestinal outbreaks with which paratyphoid bacilli are associated. Accordingly, experiments were carried out in which monkeys were fed doses of 95 to 816 billions of viable paratyphoid organisms taken from agar cultures.

The monkeys showed symptoms of illness, such as sluggishness, loss of appetite, diarrhea, and some loss of weight. In no case would death occur, and the organisms were not isolated from the blood although daily attempts at blood cultures were made.

One strain of *B. aertrycke*, originally isolated in a food poisoning outbreak in New York City, and found to produce no symptoms when heat-killed cultures were fed to man, monkeys, and other animals, was suspended in saline solution, and the suspension divided into two equal portions, one portion being boiled for 20 minutes before being fed.

Symptoms of food poisoning appeared in animals fed with living cells, not in the others. Similar positive results were obtained with an enteritidis strain, but monkeys fed with living proteus and coli strains showed no signs of illness.

In two instances monkeys in which food poisoning had been produced were fed again with the same strains three weeks later, and for the second time developed typical symptoms.—G. M. Dack, E. O. Jordan and W. L. Wood, *Proc. Soc. Exper. Biol. & Med.*, 26: 301 (Jan.), 1929.

Quantitative Studies of Responses to Different Intakes of Vitamin D—Reference is made to two recent experiments with reference to the adequacy of animal experimentation in showing the quantitative effects of vitamin D. In the work reported a diet was used containing sufficient vitamin A to make normal growth and sufficient calcium while vitamin D is abundant. Young rats were used, separated from their mothers at 21 days and 28 days. At 28 days rats were used in 3 experimental periods—28th to 56th day, 52d to 80th day, and 110th to 166th day. The 21-day rats were used in periods, 21st to 56th day, and 52d to 80th day.

Weekly determinations were made and at the end of the period femurs were dissected and ash and calcium determined.

All the criterions used in other experiments were employed here—percentage of ash, or of calcium in fresh bone, ash or calcium in the alcohol-ether extracted bone, ratio of ash to organic residue of the bone. In the experiments graded allowances of whole milk powder resulted in an increased deposit of cal-

cium in femurs, both from the time of separation to the 56th day of age, and from the 52d to the 80th day of age.

Supplementing 8 to 9 per cent of the calories with whole milk powder resulted in practically normal calcification. Similar calcification occurred with a 5 per cent of the calories supplement in from 21 to 56 days.

About 300 rats were used in this experiment and parallel results were obtained in all series, demonstrating that cow's milk contains important amounts of vitamin D. Calcium deposit of the femurs is found to be more in proportion to the supplements of vitamin D than are the weight gains.

The authors conclude that this is a definite criterion in determining proportions of vitamin D in food and that experiments have shown the advantage of such experiments upon rats immediately after separation from their mothers.—H. C. Sherman and H. K. Stieberling, *J. Biol. Chem.*, 83: 497 (Sept.), 1929.

CHILD HYGIENE

MERRILL E. CHAMPION, M. D.

A NATIONAL MATERNITY SERVICE

No one is listened to with more respect, in any discussion of maternal and infant mortality, than is Dame Janet Campbell of England. The following quotation from the foreign letter page of the *Journal of the American Medical Association* offers food for thought. All probably will agree with the statements of fact in the report; some will draw back from the connotations of "subsidy," especially if of governmental origin:

> Dame Janet Campbell, senior medical officer for maternity and child welfare at the ministry of health, in her official report, declares that, out of 1,083 infantile deaths investigated, 774 of the children were either born dead or died during the first month of life, and that unless and until good midwifery, in its widest sense, is available for all mothers, many lives that might be saved will continue to be lost. Midwifery in working class homes, she adds, cannot be properly carried out unless it is subsidized in some way. Much has already been done, but not enough. Suggested remedies include a national maternity service, such as that recently proposed by the British Medical Association. Dame Janet Campbell made the investigations as the English part of an international inquiry instituted by the League of Nations. "We are sometimes inclined to think," she writes, "that the present machinery for supervising infant health and welfare is relatively complete and satisfactory. An inquiry of this kind brings home to us forcibly how much yet remains to be done before it can be said with truth that the pregnant woman and the young infant are receiving all the support and all the assistance due them from the community if the children of the nation are to multiply and prosper." After urging the necessity for improving the general sanitary environment, and particularly the housing, she also suggests as measures to secure a further reduction in the infant death rate:
>
> 1. A well organized maternity service available for every woman who cannot afford to provide adequate facilities for herself, including: (*a*) effective prenatal supervision; (*b*) adequate attendance at childbirth by well trained and competent physicians and midwives; (*c*) hospital provision for all abnormal or complicated cases, and (*d*) whatever supplementary assistance may be required before, during or after childbirth with a view to protecting and safeguarding the health of mother and child.
>
> 2. The extension and development of home visiting and infant welfare centers so that these may be fully available for all mothers, with a view to the better education of the mother and the protection of the child from avoidable disease or infection.

3. A domiciliary nursing service for minor and major infantile maladies.

4. An increase in hospital accommodation for infants who cannot properly be nursed at home.—

Foreign Letter, *J. A. M. A.*, Oct. 12, 1929, p. 1157.

HEART DISEASE A PUBLIC HEALTH PROBLEM

One of the decisions which will have to be made soon by public health workers is: How far is it wise to go in including among public health problems such matters as heart, kidney and joint affections, cancer, etc. Common sense would seem to rule out of this field the treatment of any of these diseases. How far can we successfully prevent them? The case for heart disease is well set forth by Dr. Taliaferro Clark in the article, "Heart Disease a Public Health Problem."

Pointing out that it is unfortunate that disease conditions developing slowly seldom receive adequate recognition, Clark goes on to state that "practically 75 per cent of all cases of heart disease develop in children under 10 years of age, as compared with about 12 per cent in persons over 40 years of age." Heart disease was the third highest in the list of causes of death of children during the period of 1921–1927 in the registration area of 1920.

For the prevention of congenital heart disease we must rely upon prenatal care —with what hope of success, who can say? Acquired heart disease, on the other hand, offers a more hopeful opportunity based upon hygiene and the prevention of infections, particularly rheumatism and tonsillitis. Incriminating evidence is found in the association of certain infections with damaged hearts—tonsillitis, according to Clark, leading with 66 per cent of the cases; rheumatism in 44 per cent; diphtheria in 16 per cent; chorea in 15 per cent; and scarlet fever in 12 per cent of the cases. Faulty hygiene conduces to degenerative changes in the heart muscle. Decayed teeth are now definitely under suspicion. Figures are quoted to show the sinister relationship between tonsils on the one hand and rheumatism and heart disease on the other. In such cases the indications for prevention are clear.

From the practical point of view of getting something done through administrative action, it is pointed out that adequate school health supervision is important. Stress is rightly laid upon the value of the school nurse's follow-up work in the home. Part of the article is devoted to the treatment of the cardiac case.—Taliaferro Clark, M.D., Heart Disease a Public Health Problem, *Pub. Health Rep.*, Oct. 11, 1929.

RURAL SCHOOL DENTISTRY IN NEW ZEALAND

Dental hygiene, because of the fact that dental defects bulk largest among the physical defects of school children, rightfully may claim a place in the forefront of any discussion of child hygiene.

Two items are appended, the first relating to the United States and the second to the other side of the world. We will hear first from New Zealand:

Consideration is being given by the minister for education in the dominion to the establishment of traveling dental clinics to provide for the needs of rural school children. Some years ago there was such a clinic operating in the rural districts of Auckland board area, but the department of health had stopped the arrangement on the score of expense.

Stimulated by the good results of the rural dental service provided in Queensland, the health department has reopened the question, but the expense still remains a problem. The department maintains that the service is impracticable because of its cost. In some areas, a modified service has been provided whereby a dentist employed by the department goes from school to school, making a small charge for the treatment required. Dental nurses are being more extensively employed to carry out preliminary surveys, and to refer

those needing treatment to a school dentist working at a central point for the area.

The education department has ruled that dental treatment shall be as far as possible made available to the pupils of the registered private schools as well as to those attending the free schools conducted by the government.—Foreign Letter, *J. A. M. A.*, Sept. 7, 1929.

The second item deals with a state dental program in Tennessee. It will be carried out by the state and county health departments and has the endorsement of the state dental association. Provision is to be made for county dental units, beginning with those counties having a full-time health department. The service will consist of a thorough dental examination, with treatment offered children of the fourth grade and below who cannot go to a private dentist. A nominal fee of 50 cents will be charged for each filling or extraction. A further service will be instruction in the care of the teeth. The parents will of course be notified of the findings brought out by the examinations. The state and the county will share the expense of the county unit, a minimum of $500 being put up by each.—Public Health Dental Program, Tennessee, *Child Welfare News Summary*, Oct. 19, 1929.

Two or three comments on the above items of news come naturally to mind. New Zealand is evidently worried by the cost of such service—rightly enough—and is trying to get around the difficulty by charging a fee, presumably only part of the cost. In other words, they are trying to straddle the fence between free health service for all and self-supporting service. Again, the government is offering this service to private as well as to public schools, a course open to serious objections.

Tennessee, like New Zealand, is embarking on "state medicine" (be that good or bad) in offering surgical treatment wholly or in part at public expense. One wonders about "nominal fees." Why not have everyone pay all that he can afford (a sliding scale) or else nothing at all (if the service is one that the taxpayer is supposed to be entitled to)? Nominal fees are often only soothing syrup for an uneasy governmental conscience which senses the dangers of pauperization, but not keenly enough to take effective measure against it.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Qualifications for Rural Public Health Nurses—In preparing her paper entitled "What Preparation Should the Public Health Nurse Have for Rural Work?" read before the Public Health Nursing Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, October 4, 1929, I. Malinde Havey, R.N., of the American Red Cross Washington, D. C., sent questionnaires out to State Directors of Public Health Nursing and Red Cross Nursing Field Representatives and others who had many contacts with rural nurses, asking them to state which of a given list of factors they considered most valuable, in the order of their importance, to a rural public health nurse. Here are the results:

1. Good physical and mental health
2. At least 4 months at one of the university public health nursing courses graded and approved by the National Organization for Public Health Nursing
3. Graduation from a good nursing school
4. Good home bringing up
5. Experience in county nursing under supervision
6. High school education
7. Good personal grooming

The League Calendar for 1930—This year the National League of Nursing Education calendar presents pictures of the old and new in nursing . . . "pictures of temples of healing, ancient and modern, of the transportation of the sick as it was once done and as it is done today, of early teaching and teaching nowadays."

Every nurse will want to own one of these calendars and she will find that they make acceptable gifts for her friends. The price of the calendar is $1.00 per single copy, 75 cents per copy on all orders of 50 or over, delivered in one shipment.

Proceeds of the sale will be used to help maintain and develop the activities of the National League of Nursing Education.—*Nursing and Nurses, Ancient and Modern.* National League of Nursing Education, 370 Seventh Avenue, New York, N. Y.

A New Pamphlet for Red Cross Public Health Nurses—A new pamphlet just published by the American Red Cross will prove very useful to nurses doing any kind of public health nursing work.

The Advisory Committee on the Health Program of the American Red Cross has laid down the following principles for the conduct of public health nursing activities:

1. The nursing of patients shall be carried on only under the direction of a licensed physician.

2. In advising relative to securing medical or surgical treatment, the Red Cross does not choose between individual licensed practitioners. Such choice must be left to the individual patient or to his family.

3. The Red Cross advises with reference to securing special medical and surgical treatment only after consultation with the physician, where one is available.

Chapters which employ public health nurses should request the medical society, or the local physicians as a group, to endorse standing orders which the nurse should follow in giving nursing care on her first visit to a patient, if the patient has no doctor or if the nurse cannot get in touch with the patient's doctor.

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

It is understood that such orders do not authorize a nurse to continue giving nursing care after the first visit if there is no doctor in charge, and that the nurse will make every effort to get in touch with the doctor in order to secure his specific instruction in person.

In accordance with these principles every Red Cross public health nursing service should try to obtain standing orders from the local medical society or from the Chapter Medical Advisory Committee until such time as the medical society is ready to authorize them. The need for such orders is obvious.

The need of standing orders from the medical society for general, emergency and school use is explained.

Oftentimes when a chapter goes to the medical society to request a set of standing orders for the public health nursing service, the medical society does not understand just what is wanted, so a sample set of standing orders is given, a great deal of which is copied from the *Manual of Public Health Nursing*.*

In the part on "Bag Technique" the pamphlet goes on to say:

A careful and systematic procedure in the use of her bag and its equipment is a sign of a well trained nurse who respects the scientific nature of her work and takes pride and pleasure in a flawless and skillful technique. The American Red Cross expects every member of the Red Cross Public Health Nursing Service to use good "bag technique," as this procedure is commonly called.

Aside from the pleasure one takes in one's professional skill, there are three important reasons for the use of a scrupulously exact technique: one, to maintain safety, that is, to prevent the spread of disease from one patient to another and from patient to nurse; two, to expedite the work; a simple technique routinely used soon becomes a habit which frees the mind for other matters, speeds up the work, prevents confusion and saves the patient much nervous fatigue; three, to help in teaching the family; nothing is more impressive than skillful technique in teaching the family cleanliness, sickroom care and the ease of working systematically.

Sample technics are also given for various public health nursing procedures, again often quoting from the *Manual*. In the part on "Nursing Equipment" we quote the following:

Every Red Cross Public Health Nurse is expected to Carry a Bag Appropriate to and Properly Equipped for Her Work. The bag and its equipment are the tools of her art without which the nurse is greatly hindered in meeting technical standards. While the initial outlay required for their purchase may seem somewhat expensive to the Chapter it may be accepted as essential to the quality and effectiveness of the service. Any one of three standard bags is recommended for the use of Red Cross public health nurses according to the kind of work in which each nurse is engaged.

These are (1) the Stanley Visiting Nurse's Bag which is particularly adapted for use in visiting nursing; (2) the Stanley School Nurse's Bag designed for use in town school nursing but which also can be used for a limited amount of bedside nursing, and (3) the Red Cross County Nurse's Bag designed for use in county work which includes school nursing and other educational work, and also some emergency bedside nursing.

Further on in speaking about the contents of the nursing bag the pamphlet states:

The Bag Shall Contain no Other Drugs Than Those Which the Nurse Has Been Authorized to Use by the Local Medical Society or the Chapter Medical Advisory Committee and Which Are Covered by Standing Orders. This does not apply, however, to liquid green soap, alcohol, Lysol, vaseline and hand lotion which may be carried without an order.

Since the American Red Cross is in intimate touch with such a large number of public health nursing services of all kinds all over the country and is constantly working to improve them, this pamphlet is very practical and up-to-date and can very well be followed by every public health nurse whether she is paid by Red Cross funds or not.—*Standing Orders, Bag Technique and Nursing Equipment for American Red Cross Public Health Nurses, A. R. C. 721,* The American Red Cross, Washington, D. C., Sept., 1929.

* Published by the N. O. P. H. N., and for sale by the A. P. H. A., Book Service.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Staff Members as Members—The Public Health Education Section of the A. P. H. A. is the one professional organization of all who are doing any phase of public health education. It is the place to stand up and be counted. Executives are urged to encourage membership for all staff members doing anything in education and publicity. Cannot the department or organization provide the individual memberships?

At Your Next Convention—At the next state meeting of social workers, or any state or national meeting of health workers, let's have a health education and publicity session Breakfast, luncheon or informal dinner?

If you have no other idea for a program, offer "Questions and Answers." Invite questions in advance. Have your questions written out ready to start the meeting. The audience will quickly supply more questions. The chairman can answer some questions and get the audience to help. A committee of two or three could help the chairman handle the questions.

Merely opinion questions could be answered by raising hands. How many believe so and so? How many believe something else?

Try It on Yourself—Mail a poster or car card to your own home address. Take it out from the tube—if you can get it out without tearing the poster or tearing the tube into bits. Then try to hang the poster or card on the wall. Can you keep the top and bottom flat against the wall? Surely not, because the office rolled the printed side inside. *Every rolled poster or card received for the Minneapolis headquarters display was a problem, because the roll was too tight, or because the roll was crushed, or because the printed side was rolled inside.* Try it on yourself to learn how your office handles such shipments.

Classified Health Material—A group of portfolios displayed at publicity-education headquarters at Minneapolis contained samples of material issued by health agencies on heart disease, cancer, colds, rural sanitation, diet and weight, health examinations, winter warnings and advice, summer warnings and advice. Other portfolios contained radio talks, house organs, booklets and folders. Thus was realized the classified portfolio idea we have been seeking for a year or two. The gay labels on the portfolios were lettered by Merwin-Davis, 144 East 86th St., New York, N. Y.

The portfolios have been loaned to the Community Chest, Washington, D. C. To borrow them you pay express charges. Weight 11 pounds.

"Baby-Mother Books" Are Better and Better—A group of such pamphlets and folders on the needs of mothers or babies were received in advance of the Minneapolis meeting. Text, typography and paper are improving. There seems to be too much shiny paper, lessening readability of several folders or booklets. One state department is using too small type. One folder, *Sun Baths*, omits all men-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

tion of the publisher. Why is this, please?

The collection came from the following: Department of Health, Buffalo; Iowa Tuberculosis Association, Des Moines, Ia.; John Hancock Mutual Life Insurance Co., Boston, Mass.; Ohio Department of Health, Columbus, O.; Pilot Life Insurance Co., Greensboro, N. C.; U. S. Children's Bureau, Washington, D. C.; Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.; and one unknown source.

And That Was Minneapolis—Some education-publicity workers turned up for the first time. . . . But we missed others who should have been there. . . . Our headquarters was arranged along new lines which seemed to meet with general approval. . . . We hope to make even more classified selections of publicity materials next year. . . . Diphtheria held its own with 75 at a hastily called breakfast and many visitors to the diphtheria section of our headquarters, again in charge of Mrs. Marie Kirwan, State Charities Aid Association, New York, N. Y. . . . "It" and the contest mentioned elsewhere aroused much discussion. . . . What can we offer for critical examination next year? . . . Here is the first call for volunteers as reporters for the *Daily Bulletin* at Fort Worth. . . . Now we are more than ever sure that the annual meeting is not the time for holding a local popular health exhibition. . . . And that the technical exhibits from health departments and associations should be grouped together. . . . And that the exhibits or consultation desks of national health agencies should not be scattered among the commercial exhibits. . . . And that it would be good to have more technical exhibits and more consultation desks from national agencies. . . . As usual, the milk and cleanliness groups put on pleasing and effective displays. . . . The opinion voting on exhibits was a flop with but three ballots turned in. . . . Those who ask every year that exhibits should be criticised had their chance and passed it up. . . . What kinds of publicity and educational materials would you like to see at Fort Worth?

For and Against "It"—The booklet for girls, "It" And How, already discussed in this department was the subject of a contest at the A. P. H. A. meeting in Minneapolis. The Minnesota Public Health Association, 11 West Summit Ave., St. Paul, Minn., publisher of the booklet, offered prizes for the 5 best favorable comments, and the 5 best unfavorable comments.

None of the unfavorable comments were signed. The favorable prize winners were: M. Wolff, Minneapolis, Minn.; C. P. Archer, Moorhead, Minn.; L. von D. Chandler, Hackensack, N. J.; J. H. Larson, New York, N. Y.; Orpha Hocking, Minneapolis, Minn.

The majority of the voters thought that girls would read the booklet; that the "It" appeal is not unwholesome; and that it would influence the health habits of girls. The voters stood about half and half on this question: "Are health workers past their teens good judges of what will appeal to teen-agers of today?" Single copies of the booklet for 10 cents at the St. Paul address.

From Iceland to Siam—Dr. Rene Sand, technical counsellor, League of Red Cross Societies, says:

> From Iceland to Siam, from Dantzig to South Africa, from Canada to Chile and New Zealand, there is not a single Red Cross Society which is not endeavouring to teach the masses the elementary rules of hygiene and child welfare, instructing them in the means of checking social scourges. Tracts, brochures, posters, calendars, illustrated post-cards, press articles, children's books, bulletins, lectures, cinematograph demonstrations, traveling teams,

wireless talks, models, exhibitions, playlets, pageants, competitions, health weeks, children's weeks and cleanliness weeks—all possible means are employed, even to the advice which the Argentine Red Cross has printed on match boxes. And the above does not take into account the work accomplished by the Junior Red Cross or by public health nurses. Hygiene articles are increasing in number in the National Red Cross bulletins; some of the Soci ies are even publishing special reviews devoted exclusively to health questions, such as "Hygia," published by the Greek Red Cross.—

World's Health.

What the States Are Doing—Or Not Doing—The record is for 1925, but in one instance at least there is less doing now than in the year covered by the Rockefeller report of health departments and provinces of the United States and Canada.

Here are a few high lights from the section on Public Health Education:

Organization—The state departments of health of 17 states have a separate bureau or division in charge of educational activities, while 22 states conduct the work in the executive or central administrative office. The work is in charge of the division of child hygiene in Louisiana and Texas, the division of hygiene in Massachusetts, and is divided between the divisions of child hygiene and venereal disease control in Minnesota. In Alabama, Delaware, Missouri, and New Hampshire the head of each division is responsible for promoting the educational and publicity activities of his division. Idaho does not carry on any special educational work.

Publicity—In 10 states the director of the bureau or division of public health education is also responsible for publicity, in 27 states the executive officer himself handles publicity, and in Louisiana and Massachusetts the director of the division of child welfare handles it. In Alabama, Delaware, Kansas, and New Hampshire the head of each bureau or division gives out news regarding his division. Kentucky employs a publicity reporter, Maine designates a special clerk, and Virginia employs an experienced newspaper man. The activities of Florida and Idaho are reported as quite limited.

Educational Methods—In general, the educational program of the various states provides for publicity through articles on health subjects in newspapers, magazines, bulletins, and pamphlets, and through lectures, motion pictures, and exhibits on special subjects.

Press Service—Seventeen states maintain regular newspaper service, 27 states coöperate with the local newspapers by submitting news and other articles on health subjects from time to time and 4 states report that they do not have any press service.

Each week the Illinois State Department of Health mails a 300-word story and a page of pointed paragraphs to every newspaper in the state. Pennsylvania syndicates a weekly health letter to 300 newspapers, Texas to 450 newspapers, and Virginia to 145 papers. In West Virginia once a month a column of plate is sent to the country weeklies. At the time this material is released by the country weeklies it is sent to the city dailies as "Newsgrams."

Illustrated feature stories for the Sunday papers are prepared by the bureau of public health education in West Virginia.

Special Methods of Publicity—In recent years broadcasting has become popular and state departments of health are using this method of stimulating public interest in health education. The following states reported radio talks during 1925: Connecticut, Illinois, Iowa, Maine, Missouri, New York, Pennsylvania, Tennessee, and Vermont.

Bulletins—Thirty-five state health departments publish periodical bulletins which are issued weekly, bimonthly, monthly, quarterly, or semiannually. Six additional states published pamphlets on particular subjects, and 7 state departments of health did not publish any bulletins or pamphlets in 1925. Of the 35 states issuing a regular bulletin 27 also published pamphlets on special health subjects during 1925.

Graphic Material—Thirty-eight states own motion-picture films and many of these states have projecting machines also. (The number of states having motion-picture machines is not available.) Portable exhibits on various health subjects are used by 36 of the states.

Health trucks are used in Arkansas, Florida, Mississippi, New York, Ohio, and Virginia for the benefit of the rural population. These trucks are equipped with dynamo, moving-picture projector, etc. Portable exhibits are also transported to rural districts by these trucks.

Special Exhibits—Louisiana uses portable electrical models to demonstrate various health subjects. New York has wax models which are used by the division of venereal disease control. Wisconsin has a set of large hand-painted panels in pictorial and chart form to outline the board's varied functions and activities. One set describes the latest

procedures in the control of communicable diseases, such as toxin-antitoxin vaccination and goiter prevention; another set is devoted to the work of the sanitary engineering and plumbing divisions; and another to venereal disease prevention and social hygiene. A staff artist is employed for this work.

—Pp. 118–122, in *Health Departments of States and Provinces of the United States and Canada.* U. S. Public Health Service. (*Pub. Health Bull.* 184.)

What in this report cheers your heart?

Good Statistical Leads—Effective use of statistics in news stories is illustrated by many of the weekly press releases of the Illinois Department of Public Health.

Springfield, July 30: Instead of being stretched to greater length the life span of adults is being cut short. Mortality rates among people past 40 have increased about 10 per cent in 10 years. The percentage of all dealths in Illinois, occurring among people between 45 and 65 years, has increased from about 20 per cent in 1918 and 22½ per cent in 1920, to 27 per cent in 1927.

These statements were made here today by Dr. Andy Hall, state health director, who pointed out that the increase in average life span during recent years has resulted entirely from saving children and reducing infant mortality. Adults and especially those past 40 are actually losing ground in life expectancy compared with the situation a decade ago. . . .

Springfield, Sept. 12: Only 1 out of each 200 mothers who gave birth to children last year in Illinois failed to survive the experience, according to a statement issued here today by Dr. Andy Hall, state health director, who declared that this is the most favorable maternal mortality record ever made in the state. At the same time, Dr. Hall added, 2 out of each 3 of those who died succumbed to causes of a preventable nature. . . .

Springfield, Sept. 18: In spite of eighteen-day diet fads and the popularity of golf, a rise of 15 per cent in the mortality from diabetes last year shows that people in general are eating too much and exercising too little, according to a statement issued here today by Dr. Andy Hall, state health director. Last year 1,750 people succumbed to diabetes in Illinois, compared with 1,484 in 1928, and 1,025 in 1919, the lean war year. This increase of 70 per cent in eight years is almost exactly parallel to the rise in general post-war prosperity which has been accompanied by an unprecedented increase in rich food consumption. . . .

Springfield, Sept. 25: Accidents and tuberculosis are far and away the worst health hazards that school children have to face, accidents predominating among the grade pupils and tuberculosis among high school students. These facts were disclosed here today by Dr. Andy Hall, state health director, who pointed out that accidents and tuberculosis were responsible for 31 per cent of 4,772 deaths that occurred in Illinois last year among children between 5 and 20 years old. . .

Springfield, Oct. 23: With heart disease outdoing all other ills on the mortality calendar and the death rate from this cause in Chicago standing nearly 20 per cent above that of down-state, Dr. Andy Hall, state health director, declared in a bulletin issued here today that industry and employees generally must take a vigorous hand in a control program if the tremendous and increasing economic losses caused by cardiac disorders are to be lessened or prevented in significant degree. Nearly all of the thousands of cardiac patients can earn a substantial livelihood provided they are occupied in suitable jobs, it was pointed out. . . .

Springfield, Oct. 30: With more than 200 cases of smallpox reported from 27 different counties within the last 6 weeks, and two outbreaks of more than 30 cases each within the last 2 weeks Dr. Andy Hall, state health director, declared in a statement issued here today that the outlook for the next few months is most unpromising. While the disease is generally mild in character the quarantine period is a strict 21 days for every patient and the numerous foci are likely to result in spreading that will cause serious losses to business, especially during the holiday season. . . .

In every case the lead is followed by an interview amplifying and discussing the statistical statement. A second sheet, headed "Health Grams," carries 8 or 10 well written "filler" paragraphs. For example:

> Facts are our scarcest raw material according to Owen D. Young, who might have added that careless information masquerading as facts is our most plentiful stock in trade. If the claims of nostrum vendors and short cut cure experts were true we should soon all be supermen, and nobody would have cancer, tuberculosis or "that tired feeling."

Complete copies of above news releases, *free* on request.

MOTION PICTURES

Health Movies: How to Use Them, by H. E. Kleinschmidt, M.D. National Tuberculosis Assn., 370 7th Ave., New York, N. Y. *Free.* 7 mimeographed pages. "Difficulties to be Hurdled," "Types of Health Movies," "Shall the Motion Picture be Explained?" "A Word about Trailers," "Mechanics of Making Movies," etc.

"Sound Studio Slang," by Frank J. Wilstach. *New York Times.* Oct. 13 and 20, 1929. New words used in recording films.

Says the American Posture League: "A posture film is now in the making and will be issued by the Eastman Teaching Films of Rochester within the next few months." The League cooperated in the preparation of this film.

"Statistically Speaking—A Flagrant Misinterpretation," by E. R. Enlow. *Educational Screen,* 5 South Wabash Ave., Chicago, Ill., Oct., 1929. 25 cents. For those who may be tempted to quote over-enthusiastic statements as to the teaching values of motion pictures based in the Eastman experiments.

Universal Cinema Co., Indianapolis, Ind., announces collaboration with the U. S. Public Health Service in the production of pictures on mosquito control and malaria presentation: how airplanes, motor boats and other means are used; better and cheaper ways of mosquito-proofing houses; life cycle of the mosquito; and a variety of methods of control will be shown.

Sunshine from the Sea, issued by E. R. Squibb and Sons, 80 Beekman St., New York, N. Y., is "the story of two vitamins in their relation to health and beauty." Uses some color photography and animated diagrams. The synopsis sounds popular, with up-to-date scientific data.

How Science Aids in the Control of Infectious Disease, by Squibbs, illustrates immunity preparations and how they work.

It seems probable that both the above pictures will be useful for showings to health and social workers.

"1000 and One—The Blue Book of Non-Theatrical Films" (6th ed.). *Educational Screen,* 5 South Wabash Ave., Chicago, Ill. *75 cents.* Classified lists of pictures with distributors. Includes Physiology, Health, Hygiene, Child Hygiene, Nursing, Accident Prevention, Athletics, etc.

"Theatre Building and Equipment Buyers Guide." Supplement to *Motion Picture News,* 729 7th Ave., New York, N. Y. Detailed classification of equipment sources.

"Teaching Film Showing Intestinal Movement." *Trained Nurse,* June, 1929. Synopsis of new picture prepared at University of Chicago.

"This Great Peril," produced by Visugraphic Pictures, Inc., "carries home to the layman the warning that he must use the proper method to cope with the cancer menace and, above all, must guard against quack practices." Synopsis in *Campaign Notes.* American Society for Control of Cancer, 25 West 43d St., New York, N. Y., June, 1929. *Free.*

NEW PERIODICALS

The mid-monthly edition of *The Survey* has been so made over—and improved—that it is almost a new magazine.

Municipal Sanitation, edited by Abel Wolman, Maryland State Board of Health, to start publication January 1.

BOOKS AND REPORTS

Clinical Laboratory Methods—*By Russell Landram Haden, M.D. (3d ed.). St. Louis: Mosby,* 1929. 69 ill. 4 col. pls. 317 pp. Price, $5.00.

This book is a selection from standard reference books on laboratory methods of those determinations which are most commonly done in the clinical laboratory. In most cases only one method for each determination is given, this method being the one most commonly used at present. The subjects covered include clinical chemistry, bacteriology, hemotology, serology, clinical pathology, and short sections on tissue preparation and water and milk. Basal metabolism has been entirely omitted.

The most important addition to the present edition is the Kahn precipitation test which together with the Kolmer method for the Wassermann test comprises the section on serology.

A few other new methods such as the determination of indican in blood have been added.

With most of the quantitative chemical methods, tables are given from which the final results can be taken without calculations. An excellent section on preparation of solutions, standardizing of glassware and chemical methods is included. C. C. YOUNG

Archiv für Rassen- u. Gesellschafts-Biologie, einschliesslich Rassen- u. Gesellschafts-Hygiene—*v. 21, Heft 3. München: Lehmanns Verlag,* 1929. Price, M. 6.

This well known German journal under the able editorship of Dr. A. Ploetz and Dr. Fritz Lenz of Munich with a group of collaborators is the organ of the German Society of Racial Hygiene. It concerns itself with problems of human heredity, eugenics, and euthenics, with the emphasis upon the biological approach to the various phases of the subject. The issue on hand contains Dr. Lenz's critical discussion of Burgendörfer's statistical analysis of the decline of the birth rate in Germany, an article by Dr. H. H. Laughlin on the history of legal sterilization of defectives in the United States, a statistical study by Dr. Gschwendtner, by the questionnaire method, of the motives favoring and hindering child bearing in Austria, and a study of musical talent as shown by use of the violin in sixteen peasant families. There are also news items and critical reviews of current literature. C. A. KOFOID

At Home Among the Atoms. *A First Volume of Candid Chemistry—By James Kendall, Sc.D., F.R.S. New York: Century,* 1929. 318 pp. Price, $3.00.

Here is a popular book which develops, with essentially the same system and sequence as ordinarily used in good texts, the field covered by an introductory course in the science of chemistry. Certainly it would not serve for a text for such a course, and the author makes it very clear that the book "has not been written for the scientific expert," and is "not even intended to serve . . . as a text book for beginning students." It is far too highly diluted for such a purpose, though the diluent is seldom extraneous.

The book is written for that part of the public whose desire is "not merely to know but also to understand," and it is the sincere feeling of the reviewer

that a comprehension of this book will furnish a fundamental understanding of chemistry as a science. One should not expect it to bring a full grasp of that science. Non-chemists should not expect to learn chemistry through its perusal, though it may inspire many to read further. Chemists should be able to spend a very enjoyable, and in many cases, profitable, evening with the book, as it is delightfully written, and one cannot but feel that one's enjoyment in reading it was fully shared by the author in writing it. This personal interest on the part of the author in his presentation has resulted in a greater precision in presenting many phases than one finds in many popular treatments.

ALLEN E. STEARN

The History of a Crime Against the Food Law. *The Amazing Story of the National Food and Drugs Law Intended to Protect the Health of the People. Perverted to Protect Adulteration of Foods and Drugs—By Harvey W. Wiley, M.D. Washington: Harvey W. Wiley,* 1929. 413 pp. Price, $2.00.

The story of the fight which has been waged for the protection of the public against adulterated and unfit foodstuffs is not a pleasant one. Politics has often played a larger part than a consideration of the welfare of the public. While some adulterations have only a commercial and not a public health interest, none the less the people should be protected against them.

No single person has played a larger part in the struggle for pure foods than the author of this book. He has been in, and a part of, the struggle from the beginning. His so-called "Poison Squad" attracted wide attention, and was the means of making many people think for the first time of the quality of the foods they were buying and eating.

In the volume before us, Dr. Wiley has given a chronological account of what has taken place in governmental circles and shown up the various influences which have played so large a part in defeating the administration of the Food and Drugs Law. The book is thoroughly documented, and contains many quotations of hearings, reports, resolutions, etc. Fortunately there have always been a certain number of persons fighting on the right side, but they were often handicapped by official inaction or opposition.

The book tells the story of which no American has reason to be proud. We believe that Dr. Wiley deserves great credit for collecting in a convenient form the mass of material scattered through various governmental documents. The importance of the study of nutrition and foods is now recognized as never before. The struggle for pure foods and proper foods is by no means over. Sophistication of all kinds is still practiced. Adulterants, coloring matter, bleaching processes, etc., are still tremendously used, and probably will be until human nature becomes regenerated. The desire for gain still overshadows often the welfare of the people.

The printing and make-up of the book are good. A number of illustrations are given. As a believer in the historical method of teaching we commend this book to all students of nutrition, and to the medical profession in general, as well as to the public.

M. P. RAVENEL

You and the Doctor—*By John B. Hawes, 2d. Boston: Houghton, Mifflin,* 1929. 181 pp. Price, $2.00.

This book by Dr. Hawes has "punch" to it, holds the interest, and, best of all, offers advice that is sound and easily understood by the layman.

It takes courage to begin a book as Dr. Hawes has done by a discussion of

medical ethics. The risk is run of irritating both doctor and patient. The author by his sincere handling puts the subject on the plane of common sense. What might be termed the specialist's point of view is kept for the most part pretty well in the background. His touchstone is: The patient comes first.

A chapter on medical economics takes up the subjects of cost of sickness; physicians' fees; how to choose a good physician; and treatment by a specialist. The handling is frank—quite the best we have seen. The part dealing with specialists' fees may seem unconvincing to some.

Following these more general matters the author gets down to a discussion of symptoms, what they may mean and what to do in case you have any of them. Headache; pain in chest and abdomen; backache; tumors; hemorrhage; coughs and colds; rheumatism and neuritis; constipation; "kidney trouble"; are treated of in language which the intelligent layman can readily understand. A very good chapter is that on "Nerves"; another is the one on "Vacations." The "Family Medicine Chest" that Dr. Hawes allows has somewhat more in it than some physicians would agree to, perhaps, but a good reason is given for the inclusion of the various articles.

The keynote of this book may be said to be the frankness and honesty which the author emphasizes in the last chapter—"Doctor and Patient"—as being essential in the relations of a patient to his physician.

MERRILL E. CHAMPION

The Modern Baby Book and Child Development Record—*By John E. Anderson and Florence L. Goodenough. New York: Norton,* 1929. 398 pp. Price, $5.00.

The publishers say: "Here is a modern baby book combining the sentimental features of the conventional baby book and scientific records. The records are easy to keep and will enable you to compare your child's development with the 'average' child."

These statements are comparatively true. This is a big book, with much space for data and tests and answers to questions for ages up to 16 years, which will show a child's comparative development, and be interesting to the mother, and perhaps, later, to the subject. At the same time she is making comparisons with the author's ideas of a normal child, and so gauging her own child's progress.

However, it is *not* too easy to keep up and the effort required is possessed by many, but not all of even intelligent modern mothers.

The reviewer cordially recommends the book. W. D. LUDLUM

The Prevention of Human Tuberculosis of Bovine Origin—*By William G. Savage, M.D. (London), D.P.H. London: Macmillan,* 1929. 195 pp. Price, $4.25.

Bovine tuberculosis is a more serious, more unyielding problem in England than it is in the United States. An authentic picture of the extent of human tuberculosis of bovine origin is wanting, but the author has taken pains to examine many studies made in various places, as well as much circumstantial evidence, which leads him to assume that in Great Britain about 1 per cent of the respiratory, and 23 per cent of non-respiratory tuberculosis deaths in each year are of bovine origin. As to the number of bovine infections which do not terminate fatally, he dares not venture a guess.

The American method of dealing with bovine tuberculosis is not applicable in England, chiefly for the reason that in the United States positive reactors among cows range from 3 to 5 per cent, while in England the percentage is about ten times as great. To slaughter some

40 per cent of the dairy cattle would cause a milk famine and necessitate enormous compensation payments.

The possibility of eradicating the disease through some method of vaccination, as, for example, by the use of BCG, is full of interest, but at present holds out scant hope. There is an excellent description of Calmette's efforts to immunize cattle against tuberculosis. The method advocated by Bang, of Copenhagen, designed to bring about the rearing of herds free from tuberculosis, has apparently not resulted in the success hoped for. The practice of "designating" or certifying certain milks is a delusion. Pasteurization, while theoretically efficient, often fails lamentably in practice, as evidence of which he cites the experience of Montreal's recent epidemic of enteric fever, which was traced to milk supposed to have been pasteurized. The chief reason, however, why he is unwilling to rely on pasteurization is that its adoption would set back the steps now being taken to produce a cleaner milk, which seems reasonable in view of the wide extent of bovine tuberculosis and the haphazard, uncontrollable organization of the dairy business in England. Reliance on pasteurization alone is, to the author, a confession of failure.

The measures he advocates are based on the broad viewpoint that the problem must be solved by attacking bovine tuberculosis as a preventable disease and the campaign must be similar to that for the eradication of human tuberculosis. He recommends, in brief, the building up of the resistance of cattle by improving their environment, notoriously bad in England, and the prevention of infection from cow to cow by segregation and the immediate separation of newborn calves from their dams. He would not neglect the usual measures of keeping a vigilant eye on the milk supply as it reaches the consumer or the heat treatment of milk. That involves carefully coördinated administrative machinery, making possible frequent veterinary and bacteriological inspections, the compulsory notification of all cases, expert supervision of cattle that have general tuberculosis but no disease of the udder. If agriculturists are not prepared to coöperate actively to reduce the incidence of bovine tuberculosis, state aid in the form of indemnities and the cost of supervision will not be of sufficient moment to warrant the disturbance of existing practice, for only a slight reduction of human tuberculosis will result. Should dairymen obstruct the radical measures recommended, it will be better for the sanitarian to face the problem of preventing human infection in his own way—by controlling the milk supply as far as possible and establishing an adequate system of pasteurization—a confession of failure but the second best procedure.

The book is replete with tables and reports of research, technical information concerning the bacteriology and biology of tuberculosis and administrative procedures. The argumentative logic seems well knit together, though presumably the conclusions will not be generally accepted by American sanitarians as applicable to this country.

H. E. KLEINSCHMIDT

Hygiene of the Mouth and Teeth—*By Thaddeus P. Hyatt, D.D.S., F.A.C.D. Brooklyn: Brooklyn Dental Publishing Co.,* 1929. 64 pp. Price, $1.00.

This book of approximately 65 pages is written by the Assistant Medical Director of the Metropolitan Life Insurance Company. It is intended for general reading, and contains much useful advice on the care of the mouth and teeth, a subject which is constantly receiving more and more attention.

M. P. RAVENEL

Training Schools for Delinquent Girls—*By Margaret Reeves. New York: Russell Sage Foundation,* 1929. 455 pp. Price, $3.50.

It would be hazardous to estimate the value of this book in the field of delinquency. Certain values seem fairly clear. It gives us a perspective on the field as we have never had it before. It will provide legislators, boards and staffs with a source of information that will leave no excuse for continuing to create a permanent social liability while temporarily safeguarding society. It will provide suggestive material and analogies for those in other types of institution and other fields of social work.

The defects of this treatise are largely the defects of the field itself. One gets the feeling, despite obvious contrary attempts of the author, that the institution for delinquent girls is by itself. Perhaps this is due to the fact that the institutional life is not part of a larger program which is laid down before the girl reaches the institution, and of which the institution might be but rarely is a step in treatment. Usually the purpose in institutionalization is unburdening society of a problem, and it is left to the school to work out the plan after the first step in treatment is taken. To quote the author: "Ideally this study should have begun when the girl first entered the institution."

We raise the question—why not begin it before, so as to see if the institution is a proper step in treatment? Again the possibilities of an institution of this sort for conducting extramural work with non-institutional cases are not revealed. Surely the high grade staff advised would be of great value to those not requiring a new home. This all seems to relate to the fact that seldom is a treatment plan thought out and recorded.

Even in the suggestions for record keeping no provision is made for this most important step. If the record is thought of as the record of examinations, leading to a plan of treatment, we need not worry about its value as a check on the worker. There is also no indication of the mechanism whereby these various social, medical, and psychological examinations may be integrated.

Experience has shown that mere recording is not enough; some such instrument as the case conference is essential. This lack of integration is evident in the small extent to which the psychologist is brought into the school plan, whereas one of his greatest possibilities of contribution lies here.

The reviewer being primarily interested in the mental hygiene aspects of the book is hardly qualified to present a critical review of other features. The historical background is valuable in showing the evolution of the treatment of juvenile delinquents. The idea of constructing the institution around its functions is appealing. The chapter on psychological and psychiatric work is well said with the reservations above stated. One might take exception to the thought that these girls need to forget their sex experiences. The possibilities of making these experiences a value cannot be forgotten.

If one is looking for the trick which the schools use to turn the delinquent into an adjusted girl, he is bound to be disappointed. He reads in this book of things that might apply to any school or any home. If he is wise he might deduct from this the fact that the delinquent girl is not a different person requiring a different trick of education, but one requiring more careful attention to the principles of rearing that are applicable to any child. In the absence of a qualified home, school or society, the institution attempts to fill in the need. GEORGE S. STEVENSON

The Most Nearly Perfect Food—*By S. J. Crumbine, M.D., and James A. Tobey, Dr.P.H. Baltimore: Williams & Wilkins,* 1929. 292 pp. Price, $2.50.

The authors have prepared an interesting story of milk which is well printed and contains some 22 selected illustrations. While designed primarily for the lay reader, the book contains so many facts regarding the food value and the production and handling of milk and milk products of various kinds that it should prove useful for teachers and students of home economics, agriculture, dairy science, and public health.

Separate chapters deal with a balanced diet, a historical sketch regarding the use of milk, milk and the promotion of health, how to get clean and safe milk, and the use of milk and milk products. The reviewer is inclined to agree with the authors who state that, from our present knowledge, the main objective in milk production and control is the production of a maximum amount of milk from healthy non-reacting tuberculin tested cows under approved sanitary conditions, all of which, with the possible exception of certified milk, should be pasteurized. It should then be quickly cooled to from 45° to 50° F. and bottled in sterile containers. "Such milk is both wholesome and safe."

IRA V. HISCOCK

Bacteriology of the Home—*By Ava L. Johnson. Peoria: Manual Arts Press,* 1929. 167 pp. Price, $2.25.

This book aims to present to students of home economics and to housewives those facts about bacteriology which can be put to practical use in the home. Such subjects as washing the hands, washing dishes, cleaning the house, refrigeration, canning of foods, and the care of milk, are discussed in detail. The text is made more attractive by many photographs of agar plates showing cultures taken from washed and unwashed hands, and foods and utensils under various conditions. To the casual observer these are quite convincing pictures, though only quantity of growth is shown, without any interpretation of the significance of the organisms. The book includes a laboratory guide which gives the procedure for the production of cultures of this type.

The author popularizes the axiom, "There are bacteria everywhere," and seems to dwell unnecessarily on the obvious. Little differentiation is made between pathogens and non-pathogens. The truth of such a statement as the following might be questioned, "Anything boiled in water twenty minutes is sterile." It seems outside the province of this book to voice an opinion on vaccination and the preparation of biologic products. Complete ignorance of the subject is demonstrated conclusively in the text.

GRACE ELDERING

Human Nature and Management: *The Application of Psychology to Executive Leadership—By Ordway Tead. New York: McGraw-Hill,* 1929. 312 pp. Price, $3.50.

It should surprise no one if, after studying Mr. Tead's thorough-going treatise on the application of modern psychology to executive leadership, the executive tyro were to spend a few minutes in the outside office walking on his hands and brushing up on his defense mechanisms. For this eminently sensible specialist in the problems of personnel administration has given the beginner in the intricacies of human management a rather large order. If, having absorbed the theory of it, he succeeds in the application of it, he is a better man than a raft of executives old and new who stand very much in need of just the sort of practical advice in which this book abounds.

In his *Mansions of Philosophy,* Dr.

Will Durant suggests that some of his readers had better dispense with the opening chapters as being a bit too technical for the general run of laymen. The author of *Human Nature and Management* warns the reader not to become discouraged early in the book; but expects him to find his way through the first 10 chapters, dealing in a clear and illuminating manner with the intricacies of personality psychology. For his patience in reading these initial chapters, the layman will find a rich reward in the succeeding discussion of the practical applications which take the form of methods and procedures adjudged psychologically sound in the management of human beings.

Mr. Tead appears reassuringly antirobot. He is at his best in dealing with the problems of desirable group action. His conception of the new discipline is convincing: "that orderly conduct of affairs by the members of an organization who adhere to its necessary regulations because they desire to coöperate harmoniously in forwarding the ends which the group has in view and willingly recognize that to do this their own wishes must be brought into reasonable unison with the requirements of the group in action." In the presence of such wholesome reasoning, our faith in the blessings of American democracy gets a substantial boost. Yes, we are doing better and we will do better still, no doubt, when we have our lesson from Mr. Tead and put his wise precepts into everyday practice.

MINOTT A. OSBORN

The Mind at Mischief (*Tricks and Deceptions of the Subconscious and How to Cope with Them*)—*By William S. Sadler, M.D., F.A.C.S. New York: Funk and Wagnalls,* 1929. 400 pp. Price, $4.00.

In the language of the street, this book is "just another one of those things." In the language of science, it constitutes just another portion of psychiatric hash—and not very good hash at that. The author has drawn upon a bewildering variety of sources for the description of the various conditions but he does so without any rational classification of the various concepts and points of view involved. The result is that the non-technical reader surely must feel confused at the mental gymnastics required of him, if he is to extract from this book any orderly, comprehensible idea of what it is all about.

As far as those parts of the book are concerned which represent Dr. Sadler's own thinking, there is little to recommend. His premises often are sketchy, his deductions frequently weird, and his thinking is shallow. *The Mind at Mischief* is just about the sort of effusion one has come to expect from enthusiastic and probably well-meaning authors whose training in psychiatry is negligible or, at best, meager.

In the exhaustive list of qualifications attributed to the author on the title page, there are none that would indicate he has had the privilege of receiving competent psychiatric instruction, and when one notes that the other books by the same Jack-of-all-trades author range from discussions of "Blood Pressure and Nerves" to "Constipation," "How to Feed the Baby," "The Elements of Pep," etc., one is perhaps justified in drawing conclusions as to his competency in any one of these fields.

"The Psychologist's Introduction" by Robert H. Gault, Ph.D., Professor of Psychology at Northwestern University, and "The Neurologist's Introduction" by Meyer Solomon, M.D., Associate in Neurology at Northwestern University Medical School, likewise contribute little to the usefulness of this volume.

In general, the reviewer feels that the book is of no particular importance.

GEORGE K. PRATT

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Cincinnati, O.—Municipal activities in this city for 1928 are recorded in a carefully prepared report of 198 pages, of which 8 are devoted to the Board of Health. A diphtheria prevention campaign was launched by the Health Department under the auspices of the Academy of Medicine, and over 25,000 children under 10 years of age went to their family physician or to a clinic for the toxin-antitoxin treatments. Next in importance was the summer round-up of preschool age children. This was the second year of an extensive program of preparing children under the age of 5 for their first year in school.

A health center houses a diagnostic chest clinic, primarily for the prevention of tuberculosis, a venereal disease clinic, an adult dental service, a heart clinic, a children's division, and the administrative offices of the Public Health Nursing Bureau. During the year a full-time medical service was developed.

A permit system inaugurated for all food establishments in 1926 is said to have resulted in marked improvement in shop sanitation. A total of 6,529 applications for permits were filed, at a service charge of $2.00 for each inspection. Seventeen permits were revoked from establishments which failed to maintain proper sanitary standards. Effective this year, it was also necessary for the milk collectors to obtain a permit from the Health Department in order to deliver milk for use in the city.

Coincident with the general pasteurization which became effective in 1915, there has been a marked decline in the number of cases of typhoid fever, diphtheria, tuberculosis, and other communicable diseases that are milk-borne. Paralleling this, we see a marked decrease in infant mortality, and especially in the deaths from gastroenteritis among children under the age of 2.

Each public health nurse carries out a generalized program in her district. By this means, "the family is the unit with which the nurse works rather than the individual who may present a special condition. This procedure results in an elasticity of service which insures health supervision for every member of the family." There were 41,868 home nursing visits made in 1928.

Knoxville, Tenn.—The 1928 report estimates the population of this city as 105,400, and records a general death rate of 14.09 (12.8 for whites and 20.7 for colored), the resident rate being 12.9. A birth rate of 22.8 and an infant mortality rate of 87 are also noted. The leading causes of death are pneumonia, heart disease, tuberculosis, nephritis and congenital and early infancy conditions.

Milk supervision is exercised in accordance with the Standard Milk Ordinance which was adopted in 1924 and has stimulated marked improvement in conditions. Some 506 dairies with 6,569 cows produced an average of 11,059 gallons of milk daily, or nearly 0.9 pint per capita. There were 1,364 dairy inspections. Approximately 51 per cent of the milk supply is pasteurized.

Progress is noted in generalized nursing service, a total of 75,829 home visits having been made last year. There were 10,778 new cases admitted and 10,502 cases discharged. Of the new cases, 1,439 were under 1 year of age and 1,178 were 1 to 6 years of age, while 1,254 were 6 to 16 years of age and 6,917 were over 16 years. Some 2,800 visits were made to 436 well baby conferences.

This mimeographed report of 89

pages abounds in statistical tables, charts, and graphs, which add materially to the interest and value of the annual record of accomplishment.

Rhode Island Tuberculosis Survey—A constructive survey of the tuberculosis work in 15 towns of the state has been made by the Superintendent of the State Sanatorium. These are towns in which tuberculosis clinics have been conducted by the medical staff of the sanatorium for periods varying from 2 to 7 years.

According to standards of the *Appraisal Form for City Health Work,* reporting averages only half of the standard of 2 cases (all forms) annually per death. One town receives full credit. The standard of 50 field nursing visits to homes of tuberculosis cases is reached by 7 of the 15 towns, while in 3 towns fully 20 per cent of the home visits were made to ex-sanatorium cases as is recommended.

The clinics in these towns are almost entirely diagnostic in nature, the patients being sent back to their physicians for treatment. In some of the towns hospitalization is high and unusually prompt. There were 1,190 individuals who made 1,543 clinic visits during the year.

Hospitalization at the State Sanatorium, Providence City Hospital, Hills' Grove Hospital and the Crawford Allen Hospital during 1928 amounted to 164,101 hospital days against an Appraisal Form standard of 123,750. This figure is exclusive of preventorium. Newport has a summer camp for children and a pasteurized milk supply.

Seattle, Wash.—This city with an estimated population of 383,200 reports a birth rate of 13.03, a death rate of 10.4 and an infant mortality rate of 42 for the year 1928. Physicians in attendance at child welfare clinics for the purpose of making examinations and giving advice are selected children's specialists working under the management of the Seattle Pediatric Society in coöperation with the department of health. There were only 4 deaths from diphtheria with none from scarlet fever or smallpox during the year. The report recommends that necessary legislation be enacted to make compulsory the pasteurization of all of the city's milk supply with the exception of the certified product.

New York Tuberculosis Clinics—The 20th annual report of the Association of Tuberculosis Clinics, for 1928, shows that this voluntary organization includes in its membership 27 clinics functioning either under municipal or private auspices. Their activities are confined to clinic and home work among the tuberculous and the exposed families of these patients.

In 1927, 40 per cent of the patients came to clinics in the first stage of the disease, 42 per cent in the second stage, and 18 per cent in the third stage. In about two-thirds of the cases then there was already extensive involvement of one lung or disease of both lungs. Efforts are made to examine all members of households of tuberculosis patients and to maintain a continual check on the situation. These clinics are coöperating in a study of the effect of Calmette-Guérin vaccine on infants in actual contact with tuberculosis.

Winnipeg, Man.—The city assessor's figures show a population in 1928 of 202,377, while the annual report of the medical health officer indicates that there were 1,806 deaths in the year, or a rate of 8.9. An infant mortality rate of 63.46 is recorded. An influenza outbreak in December is said to have raised this rate from an average for 11 months of under 60. A birth rate of 22.1 is

only slightly lower than that for the previous year, while the marriage rate of 13.9 is higher (12.27 in 1927).

An excellent financial statement is presented in two parts, one covering the control and prevention of disease services, the other, refuse collection and disposal and street cleaning services. The net per capita expenditure under the first heading was 59.1 cents, being about one-third as large as that for the other items.

The outstanding event of the year from a health standpoint is said to be an outbreak of acute anterior poliomyelitis which occurred during the summer and early autumn. The report contains an interesting analysis of the outbreak with an account of measures carried out. The type, particularly in the early cases, was severe and the percentage of fatalities high. Of 225 city cases, 100 were among females. Ages varied from 2½ to 15 years. When a case was isolated in a home, children who resided on the premises were quarantined. Food handlers were quarantined unless arrangements were made for their change of address when the individual was prohibited from engaging in such occupation for a period of 2 weeks. Teachers, or persons having to do with children when exposed to a case, were quarantined for a similar period. Concurrent disinfection was recommended and at the termination of a case, thorough cleansing, sunning and airing of material in the sick room with soap and warm water were instituted. It is believed that the administration of serum early in the attack was of definite value.

Fort Worth, Tex.—The annual mimeographed report of the department of public health for the year ending September 30, 1929, shows that of the 2,929 births, 35 per cent occurred in hospitals. There were 1,941 deaths from all causes, of which 369 were among Negroes and 91 among Mexicans. Of these deaths, 134 occurred among infants under 1 month and 106 among infants of 1 month to 1 year of age. Communicable diseases are recorded according to the number of cases, the number of health department visits, the number of contacts, and the number hospitalized.

Twenty boarding homes were granted permits during the year and 906 children were placed in licensed boarding homes. A total of 1,162 birth certificates were delivered by nurses, while in 624 cases the homes could not be located for this purpose. Of the 9,501 persons who attended the health centers, 2,893 were infants and 3,495 were preschool children.

BOOKS RECEIVED

THE LAYMAN LOOKS AT DOCTORS. By S. W. and J. T. Pierce. New York: Harcourt, Brace, 1929. 251 pp. Price, $2.00.

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. By Various Authors. Vol. III. London: His Majesty's Stationery Office, 1929. 413 pp. Price, $6.00.

THE MIND AT MISCHIEF. By William S. Sadler. New York: Funk & Wagnalls, 1929. 400 pp. Price, $4.00.

THE MOST NEARLY PERFECT FOOD. By Samuel J. Crumbine and James A. Tobey. Baltimore: Williams & Wilkins, 1929. 292 pp. Price, $2.50.

BACKGROUNDS OF BIOLOGY. By John Giesen and Thomas L. Malumphy. Milwaukee: Bruce Pub. Co., 1929. 278 pp. Price, $2.50.

TULAREMIA—HISTORY, PATHOLOGY, DIAGNOSIS AND TREATMENT. By Walter M. Simpson. New York: Hoeber, 1929. 162 pp. Price, $5.00.

CHEMICAL ENGINEERING CATALOG. 14th ed. New York: Chemical Catalog Co., 1929. 1,205 pp.

HANDBOOK OF PHYSICAL EDUCATION. By Ernest G. Schroeder. New York: Doubleday, Doran, 1929. 323 pp. Price, $2.00.

NATURE STUDY—HEALTH EDUCATION SERIES. By Alice Jean Patterson. Normal, Ill.: McKnight, 1926, 1927, 1928 and 1929. Grades I and II, $.96; Grade III, $.80; Grade IV, $.80; Grade V, $.92; Grade VI, $.96. Science for the Junior High School, $1.60.

THE DOCTOR IN COURT. By Edward Huntington Williams. Baltimore: Williams & Wilkins, 1929. 289 pp. Price, $3.00.

HOOKWORM DISEASE. Its Distribution, Biology, Epidemiology, Pathology, Diagnosis, Treatment and Control. By Asa C. Chandler. New York: Macmillan, 1929. 494 pp. Price, $5.00.

PSYCHOLOGY AND INDUSTRIAL EFFICIENCY. By Harold E. Burtt. New York: Appleton, 1929. 395 pp. Price, $3.00.

THE RAT: A WORLD MENACE. By A. Moore Hogarth. London: John Bale, Sons & Danielsson, 1929. 112 pp. Price, $2.50.

THREE MINUTE MEDICINE. By Louis R. Effler. Boston: Badger, 1929. 453 pp. Price, $3.00.

DISEASES OF WOMEN: SYMPTOMS AND TREATMENT. By Franklin I. Shroyer. Boston: Badger, 1929. 103 pp. Price, $2.00.

PUBLIC RELATIONS OF THE COMMISSION FOR RELIEF IN BELGIUM. Documents. By George I. Gay. Stanford University: Stanford University Press, 1929. Two volumes, 606 and 539 pp. Price, $10.00.

APPLIED ELECTROCARDIOGRAPHY. By A. E. Parsonnet and A. S. Hyman. New York: Macmillan, 1929. 206 pp. Price, $4.00.

SUMMARIZED PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE FOR THE PERIOD FROM JUNE, 1925, TO JUNE, 1929. Washington: American Association for the Advancement of Science, 1929. 1,006 pp.

LAWS CONCERNING BIRTH CONTROL IN THE UNITED STATES. New York: Committee on Federal Legislation for Birth Control, 1929. 39 pp. Price, 25c.

CHILD CARE AND TRAINING, rev. ed. By Marion L. Faegre and John E. Anderson. Minneapolis: University of Minnesota Press, 1929. 274 pp. Price, $2.00.

GEWINNUNG UND KONTROLLE DER TRINKMILCH. By Dr. H. H. Boysen. Hildesheim: Verlag der Molkerei-Zeitung, 1929, 77 pp.

THE ESSENTIALS OF HEALTHY LIVING. By J. Mace Andress and I. H. Goldberger. Newtonville: Jennings Pub. Co., 1928. 31 pp. Price, $.20.

PETTIBONE'S TEXTBOOK OF PHYSIOLOGICAL CHEMISTRY WITH EXPERIMENTS. 4th ed. By J. F. McClendon. St. Louis: Mosby, 1929. 368 pp. Price, $3.75.

THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE. (Including Tropical Diseases.) By Prof. Dr. Victor Schilling. 7th and 8th rev. ed. St. Louis: Mosby, 1929. 408 pp. Price, $10.00.

THE SCIENCE OF NUTRITION SIMPLIFIED. By D. D. Rosewarne. St. Louis: Mosby, 1929. 314 pp. Price, $3.50.

SCHISTOSOMIASIS AND MALARIA IN RELATION TO IRRIGATION. By J. F. C. Haslam. London: His Majesty's Stationery Office, 1929. 52 pp. Price, $.35.

PRACTICAL PLANNING FOR SCHOOL FOOD SERVICE. Prepared by The John Van Range Co., Cincinnati, O. Free.

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BOYD, J. D., *et al.* Dietary Control of Dental Caries. Am. J. Dis. Child., 38, 4: 721 (Oct.), 1929.

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GORDON, B., and BAKER, J. C. Observations on the Apparent Adaptability of the Body to Infections, Unusual Hardships, Changing Environment and Prolonged Strenuous Exertion. Am. J. M. Sc., 178, 1: 1 (July), 1929.

Incomplete Reporting of Births—The possibility of correcting reported birth rates as the author has done for the city of Baltimore, suggests the need for adjusting all birth statistics for the years prior to complete birth registration. This proposal would make less startling many convincing graphs showing the remarkable savings in infant lives by this and that child health activity.

HEDRICH, A. W. Correction of Birth Rates for Incomplete Reporting. Am. J. Hyg., 10, 2: 435 (Sept.), 1929.

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HARMON, C. E. A Comparison of Two Methods of Obtaining Epidemic Cycles. J. Prev. Med., 3, 5: 405 (Sept.), 1929.

Is Immunity Transmitted to Babies?—The author studies the incidence of reportable diseases by months throughout infancy; presents his findings; leaves the answer to the reader. A stimulating and brief paper.

KNOWLTON, M. Do Mothers Transmit Immunity to Their Children? J. Prev. Med., 3, 5: 385 (Sept.), 1929.

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LEE, W. W. The Epidemiology of Tuberculosis, Past and Present. Am. Rev. Tuberc., 20, 3: 368 (Sept.), 1929.

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LOMBARD, H. L., and DOERING, C. R. Cancer Studies in Massachusetts. J. Prev. Med., 3, 5: 343 (Sept.), 1929.

Metal Poisoning—The possibilities of poisoning by the ingestion of small amounts of lead, arsenic, etc., are discussed in detail.

MYERS, C. N., and THRONE, B. Health Hazards from the Ingestion of Small Amounts of Metals. New York State J. Med., 29, 20: 1258 (Oct. 15), 1929.

British Dairy Supervision—A paper on the sanitation of milk production in which the word "pasteurization" did not appear would be a rarity in the United States. How cows shall be kept and inspected and how milk is to be handled are discussed at length; but there is no word about pasteurization.

RABAGLIATI, D. S. The Milk and Dairies Order, 1926. Pub. Health, 42, 12: 408 (Sept.), 1929.

Tropical Medicine—A bird's-eye view of the problems of tropical medicine and the world-wide organization built to meet them.

REED, A. C. Tropical Medicine. Sci. Monthly, p. 458 (Nov.), 1929.

Industrial Health—The first ten of a series of health practice pamphlets to be issued by the Industrial Health Division of the National Safety Council have been published. They deal with the following subjects: chromium, lead, physical examinations, health supervision, eye hazards, carbon monoxide, wounds, skin affections. Health workers who have industrial hygiene problems to meet will find this series invaluable.

SAPPINGTON, C. O. Health Practice Pamphlets 1–10. National Safety Council, Chicago, Ill.

Organisms in Malignant Tumors—Reporting the findings of many years of study of an organism recovered from malignant tumors, never found in benign growths. Although the presentation is highly technical and no conclusions are attempted, health workers will be interested, if only because they will gain anew a wholesome respect for the newer conceptions of bacteriology.

STEARN, E. W., *et al.* The Ontogeny of an Organism Isolated from Malignant Tumors. J. Bact., 18, 4: 227 (Oct.), 1929.

Reducing Diets—The rudiments of weight reduction through diet are briefly presented. Specimen diets are suggested and tables of vegetables given.

TERRY, A. H. The Reducing Diet. New York State J. Med., 29, 19: 1192 (Oct. 1), 1929.

Baby Clinic Practice—In this British clinic a room with an out-door sheltered court is set aside where mothers may bring their children during the nursing period. Here the attendants can discover errors in breast feeding technic. Seemingly a sensible suggestion for babies needing such observation.

WALLER, H. K. Avoiding Failures at Infant Clinics, Med. Off., 41, 24: 263 (June 15), 1929.

Living in the Tropics—Life in the tropics will become more comfortable and safe for the white man but acclimatization, in its full and literal sense, will remain impossible. This is the interesting conclusion of this treatise, worth reading by all who face the problem of fighting heat.

WARD, R. D. The Acclimatization of the White Race in the Tropics. New England J. Med., 201, 13: 617 (Sept. 26), 1929.

Maternity Nursing—Worth-while illustrations with their detailed captions add greatly to the very practical information contained in the article mostly about the care of new-born babies. It is a fine example of the value of good illustrations intelligently used. The pictures are from the author's excellent new book *Nurses Handbook of Obstetrics*.

ZABRISKIE, L. E. Maternity Nursing in Hospital and Home. Am. J. Nurs., 29, 10: 1157 (Oct.), 1929.

NEWS FROM THE FIELD

DEVELOPMENT OF SCHOOL HYGIENE

BUENOS Aires, Argentina, was the first city in South America to start school-hygiene work. This work was introduced in Buenos Aires in 1886. At present the school medical board employs a large number of physicians, several dental inspectors, a large staff of health visitors, and one psychiatrist.

There are various kinds of clinics for the teachers and school children, such as eye clinics, ear, nose, and throat clinics, dental clinics, x-ray clinics, clinics for tuberculous children, and clinics for backward children. The school authorities have also established summer colonies for underfed children; school lunches are also provided.

In Rio de Janeiro, Brazil, the school medical service is only a few years old. A large number of school physicians, dentists, and nurses are employed. The school nurses assist the doctors during the examinations of the children and visit the children at their homes. There is a movement for the establishment of clinics for the free treatment of school children.

In Chile, as a result of a reorganization in 1928, a school medical service has been established in several cities.

In Santiago the school medical service consists of physical examinations of the school children and of clinical treatments. The work is carried on by physicians, assistant physicians, and nurses. There are in Santiago clinics for the diseases of the eye, ear, nose and throat, and a psychological laboratory. At the end of 1928 the government entrusted the school medical service to the care of the Ministry of Hygiene and Social Welfare. This permits the extension of the work to every part of the country where a public health officer is located.

The school medical service of Uruguay seems to be limited to the capital, Montevideo. It was established in 1908, but it has been extensively developed only in the last decade. There is now a large number of school physicians and nurses. School clinics have been established for the treatment of diseases of the eye, ear, nose, and throat, skin, and lungs; there is also a nutrition clinic. Several open-air schools and vacation camps are maintained by the Government, and a school-lunch system is maintained by a private society.—*Boletin del Institute Internacional Americano de Proteccion a la Infancia*, July, 1929.

INTERNATIONAL CONGRESS OF AMERICAN UNIVERSITIES

TWENTY-ONE nations of the New World will be represented in Havana on February 15, 1930, when the First International Congress of American Universities convenes. Fifteen important educational points are to be discussed, and these questions are now in preparation.

The fundamental aim of the Congress is to introduce international subjects into curriculums for the purpose of creating confraternity in student circles.

Dr. Octavio Averhoff, dean of the University of Havana, announced that two of the prominent guests of the congress will be Dr. Ray Lyman Wilbur, Secretary of the Interior and President of Leland Stanford University; and Dr. Charles Mayo. Both of these men will receive the degree *honoris causis* of the University of Havana during their stay.

THE PRESCHOOL CHILD

AN interesting and attractive booklet for the mother of the child under 6 years of age has been written by Dr. Richard M. Smith, Assistant Professor of Child Hygiene at Harvard Medical School. The title of the booklet is *Between Two Years and Six.*

Advice is given to mothers about the care of the child's body in health and sickness, and the child's mind as well. Space is provided for recording the child's development from year to year for the benefit of the mother and the physician who may see the child from time to time. This booklet is offered free to health officers and social agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company of Boston, Mass.

PHYSICIANS IN CONGRESS

WHEN the Seventy-first Congress of the United States convenes in December there will be 7 physicians in it. At the last Congress there were 8 and the Sixty-ninth Congress had only 6.

The newest physician congressman is Senator Henry D. Hatfield of West Virginia; the oldest in the point of service is Representative John W. Summers of Washington.

The other physicians in this Congress are: Dr. Royal S. Copeland and Dr. William I. Sirovich of New York, Dr. J. Howard Swick of Pennsylvania, Dr. Edward M. Irwin of Illinois and Dr. Frank P. Bohn of Michigan.

STUDY OF BIRTHS

TRIPLETS are born about once in every 10,000 births.

Twins occur about once in 98 births.

These facts are disclosed in a study of births in non-municipal hospitals of the United Hospital Fund of New York, made by the Fund in maternity hospitals of the group and the maternity services of its general hospitals last year. Thirteen hospitals reported a total of 19,473 babies born last year. During the year there were only 2 instances of triplets, and 201 of twins. There were no quadruplets.

NEW OFFICERS OF DELTA OMEGA

AT the annual meeting of Delta Omega, the honorary public health society, held in Minneapolis on October 2, 1929, during the convention of the American Public Health Association, C. C. Young, Ph.D., D.P.H., Director of the Bureau of Laboratories of the Michigan State Department of Health, was elected national president. John A. Ferrell, M.D., Dr.P.H., of the Rockefeller Foundation of New York, was elected national vice-president, and James A. Tobey, Dr.P.H., of New York, was reëlected national secretary-treasurer.

SIGHT TEST FOR SAILORS

THE U. S. Public Health Service, for over 50 years, has conducted examinations and reëxaminations of masters, mates and pilots of American vessels, to determine visual and color perceptions. This has been done at the request of the U. S. Steamboat Inspection Service.

Lately, however, a more rigid test has been needed, and the commonly applied test with yarns and lanterns seems inadequate. After an intensive study, the Surgeon General of the U. S. Public Health Service has decided to introduce a " foolproof " method of testing vision, by using the colored plates test of the kind of which the Stilling's method is representative. This test has been adopted by the U. S. Navy and enables the medical officers to determine easily and with much precision whether an applicant has defective color sense, because, if so, the candidate is totally unable to perceive the figures that appear

upon the dotted chromatic plates. These are easily discernible to a person of normal color vision.

To prevent injustice to licensed pilots, masters and mates, the old test will be used when they are reëxamined.

UNIVERSITY COURSE IN ACCIDENT PREVENTION

AT the 18th Annual Safety Congress held in Chicago, September 30 to October 4, it was revealed that 97,000 persons were killed by accident in the United States during the last year—the greatest total of such casualties in the history of the country. At the same time the records of the New York State Department of Labor show that during the first 7 months of 1929 in the metropolitan district alone 10,000 more accidents were reported than during the corresponding period of 1928. This is characteristic of the situation in industry and in public life throughout the country. It is the belief of close students of this problem that the major cause of the present situation is the lack of leaders in this new profession. New York University has therefore decided this year to make its course for the training of public and industrial safety directors available to any interested man or woman showing qualities of leadership, irrespective of previous academic education. Ten free scholarships will be given.

The course will be given evenings at the Washington Square Branch of the University, and will be conducted in cooperation with the Museum of Safety and ten industrial and commercial associations which have been asked to designate scholarship students.

Students will be taken through the plants of members of the Museum of Safety and the various industrial associations where they may observe the technic of accident prevention.

BIOLOGICAL SUPPLY COMPANIES MERGE

PHYSICIANS and health officers will be interested in the merger of the H. K. Mulford Company and Sharp and Dohme, Inc. The latter has acquired all of the assets of the Mulford Company. An interest in Sharp and Dohme has been acquired by Alex. Brown and Sons associated with Chas. D. Barney and Company and Brown Brothers and Company.

The consolidation and merger craze has reached even biologicals and medical supplies. Physicians and health officers are interested in the stability and character of firms manufacturing and distributing such materials.

PERSONALS

DR. THOMAS J. SASSER has been appointed school physician in the Health Department of Charlotte, N. C.

DR. WALTER R. BERRYHILL of Belmont, N. C., has accepted an appointment on the faculty of the School of Medicine of the University of North Carolina.

DR. JULIUS F. MAUERMANN has been appointed health officer of Monroe, Wis.

DR. NELSON C. DYSART has been appointed as City Health Commissioner of Columbus, O. Dr. Dysart succeeds Dr. James A. Beer, who resigned.

ROBERT B. WATSON is the new Industrial Secretary of the Chicago Tuberculosis Institute, Chicago, Ill.

LEVERETT D. BRISTOL, M.D., Fellow of the A. P. H. A., who for the past year has been making a Health Survey of

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